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Great Britain

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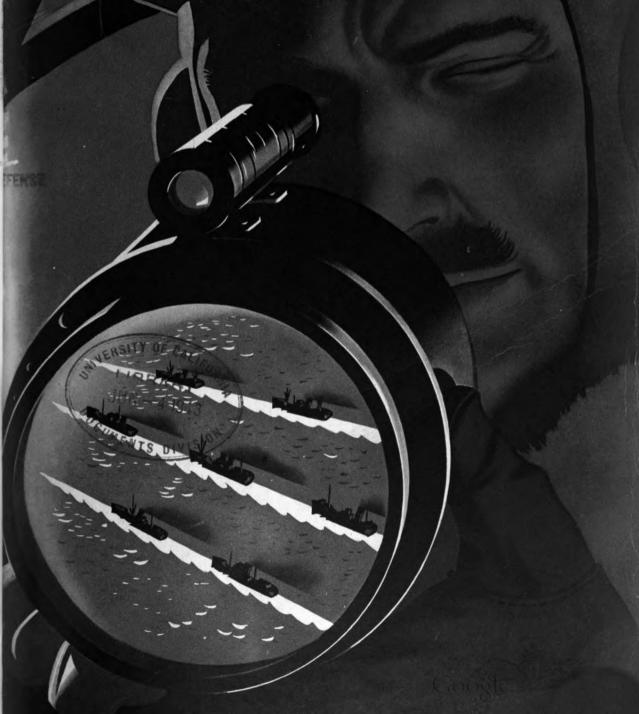
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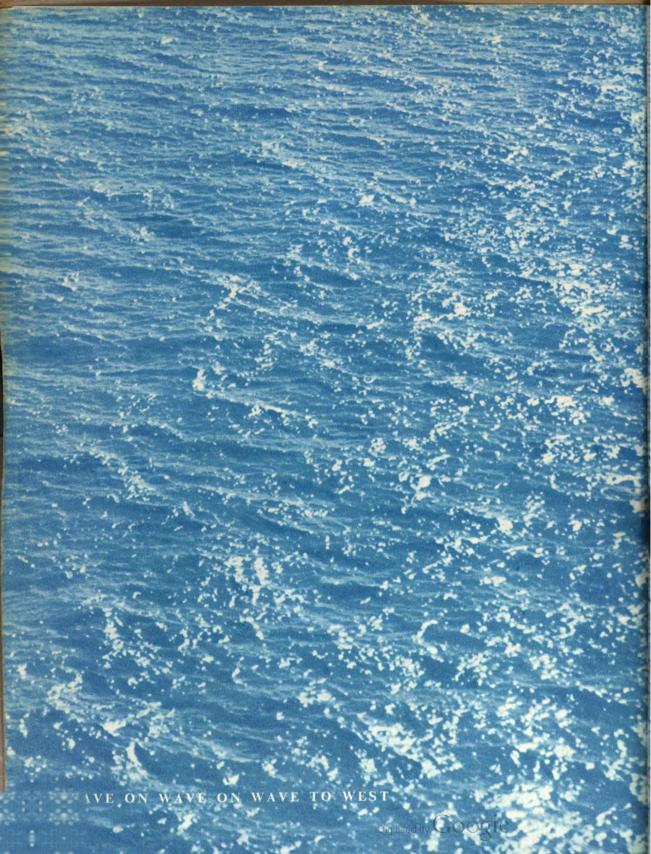
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COASTAL COMMAND









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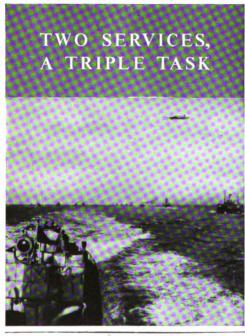
COASTAL COMMAND

THE AIR MINISTRY ACCOUNT OF THE PART

PLAYED BY COASTAL COMMAND IN THE

BATTLE OF THE SEAS

1939 • 1942 -



CHAPTER 1

"It's the 'Bismarck'!" Page 8

CHAPTER 2

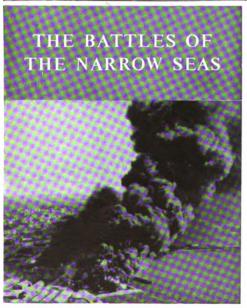
Plot of Operations Page 17

CHAPTER 3

The Men and the Aircraft Page 26

CHAPTER 4

Flying Start: September 1939 Page 34



CHAPTER 5

The Fight for Norway Page 42

CHAPTER 6

Heinkel-haunted Skies:

the Attack in the West Page 50

CHAPTER 7

Seeking the Raider in his Lair Page 56

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CONTENTS

CHAPTER 8

Ten Million Miles of Sea Page 66

CHAPTER 9

Ocean Rendezvous Page 80

CHAPTER 10

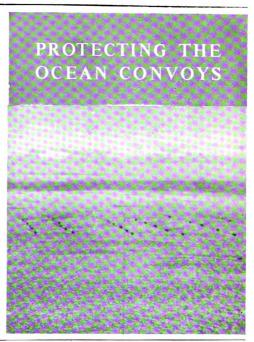
The Attack on the U-Boats Page 98

CHAPTER 11

The Big Bad Wulf Page 106

CHAPTER 12

Rescue Flights and Secret Missions Page 114



CHAPTER 13

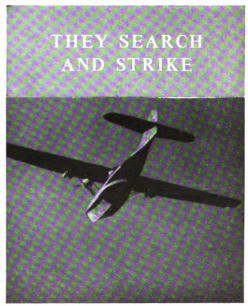
Blockade by Mine and Bomb Page 124

CHAPTER 14

Torpedoes Running Strongly Page 134

CHAPTER 15

Their Spirit is Serene Page 142



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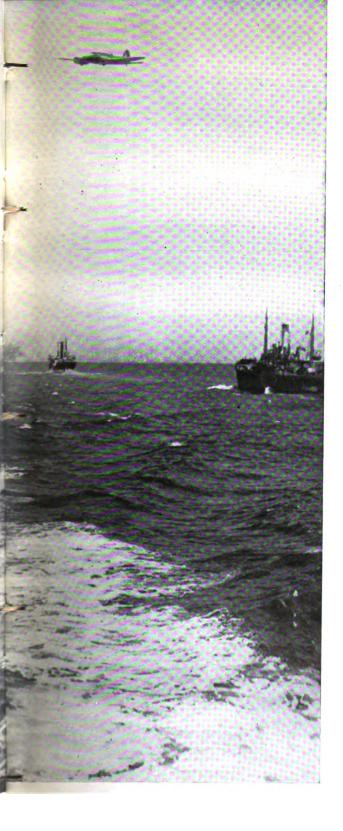
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TWO SERVICES

A TRIPLE TASK

Find the enemy; strike
the enemy; protect our ships
—that is the triple task of
Coastal Command, in which
the Royal Navy co-operates
with the Royal Air Force.

1: "It's the 'Bismarck'!"

"I GIVE YOU the hunter's toast: 'Good hunting and a good bag." With these words Admiral Lütjens ended his speech to the ship's company of the "Bismarck." They were heard throughout the vessel, those who could not be on deck listening to them through the loudspeakers situated in various parts of the battleship. The hour was a few minutes past noon on Monday, 19th May, 1941. evening the "Bismarck" weighed anchor and put to sea, taking a Northerly course from Kiel Bay. It was the intention of Admiral Lütjens to raid commerce in the Atlantic. He had done so before earlier in the year, flying his flag in the "Gneisenau," which together with the "Scharnhorst" had sunk twenty-two British and Allied ships, including the "Jervis Bay." The "Gneisenau" and "Scharnhorst" were now in Brest and had already suffered damage from the attacks made on them by aircraft of Bomber and Coastal Commands. If Germany was to obtain a decision in the Battle of the Atlantic, other units of her Navy must be sent to sea. The "Bismarck" and the "Prinz Eugen" were chosen.

For the "Bismarck" it was her first and last voyage. She formed the main unit of a squadron made up of the eight-inch cruiser the "Prinz Eugen," two destroyers and two mine-bumpers. After passing through the Great Belt the squadron moved up the conquered coast of Norway, and on the morning of 21st May entered a fjord near Bergen, where it anchored. There had been little sleep on board during that night, for an air-raid alarm had kept the crews at action stations until half-past eight in the morning. There was another alarm in the early afternoon which

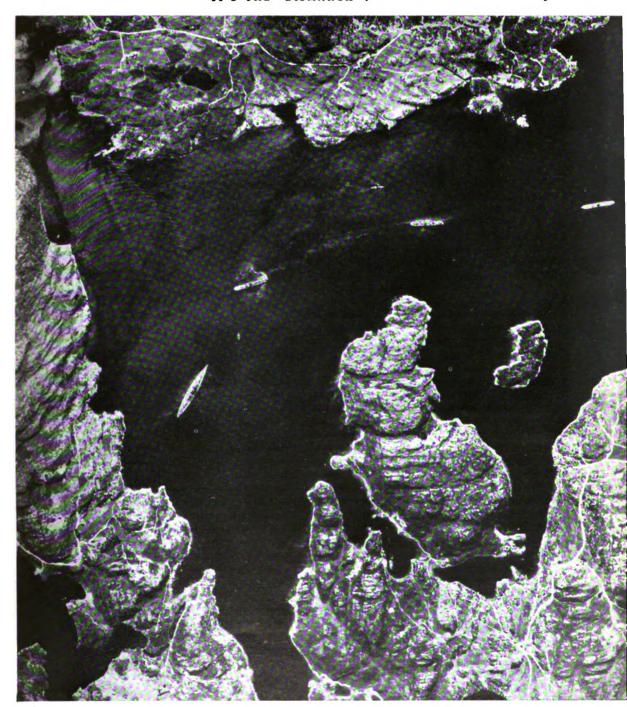
lasted a quarter of an hour. A little before dusk the squadron put to sea again.

That day an aircraft of Coastal Command, in the course of a reconnaissance of the Norwegian coast, had flown as far North as Bergen. Reconnoitring the approaches to that port, the pilot discovered two warships, one of large size, at anchor in a small fjord.

On his return he made a cautious report of what he had seen to one of the Station Intelligence Officers. While they were talking the wet prints of the photographs which the pilot had taken were brought in. The Intelligence Officer examined them and saw that what the pilot surmised was indeed the truth. He spoke immediately with Headquarters, Coastal Command. "Bring me those prints at once," ordered the Commander-in-Chief.

A slight difficulty arose. The only aircraft available to take them to Headquarters was that of the pilot who had just finished the patrol. Moreover, it was now evening. Nevertheless, he took off and flew South until with night fallen he found himself short of petrol on the outskirts of Nottingham, his home town. Here he landed and roused a friend of his, the owner of a garage and of a motor-car. They continued the journey together, driving through the night and the blackout at an average speed of fifty-two miles an hour. The prints were delivered at Coastal Command Headquarters in the early hours of the morning. Admiralty and photographic experts confirmed the opinion of the Intelligence Officer in Scotland. The "Bismarck" and the "Prinz Eugen" were out.

Very early that same morning they were attacked by six Whitleys and six Lockheed-Hudsons of Coastal Command. The attack was



The picture that sank a battleship. The "Bismarck" caught by photographic reconnaissance in Dobric Fjord, just before she weighed anchor for her first and last sortie.

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unsuccessful, for the weather was very thick and only two of the aircraft succeeded in reaching the fjord, where they dropped their load of armour-piercing bombs with no observed effect. Throughout that day—it was 22nd May -the weather could justifiably be described as atrocious. Nevertheless, reconnaissance of the Norwegian coast was maintained from first light until dark, every available aircraft of Coastal Command on the east coast of Scotland and the coast of Yorkshire being pressed into service. They flew at times through a full gale, at times through dense haze and cloud extending downwards to sea-level. Hour after hour they plunged into the mist shrouding Bergen harbour and the nearby fjords. It was in vain. No ships were seen. One of the pilots expressed the opinion that the enemy was no longer there because "I collided with nothing though I flew over the harbour at sea-level."

The truth of this conjecture was proved about 6.30 that evening when the clouds above Bergen lifted for a moment—long enough for a shorebased naval aircraft, a Maryland, to report that a clear view had been obtained and that no warship had been seen. This aircraft was manned by very experienced officers of the Fleet Air Arm, who carried out the flight successfully in spite of very bad weather and obtained information of the highest importance. Through that long day the "Bismarck" and the "Prinz Eugen" had, in fact, been steaming steadily Northwards, having parted company with their destroyers in the small hours. At 1.0 a.m. on 23rd May the enemy altered course to pass through the Denmark Strait between Iceland and Greenland. By this time they were fully aware that they had been seen, but they judged that to follow this route would offer the best chance to elude the British Fleet now steaming to intercept them.

The weather on 23rd May was still very bad—too bad to patrol the Norwegian coast. Sunderland flying boats and Hudsons were able to cover the passages between Iceland and the Faroes and between the Faroes and the Shetlands. The Sunderlands maintained their patrol in relays from a quarter past six in the morning to a quarter past nine in the evening, the Hudsons from 4.0 a.m. to 5.15 p.m. The Sunderlands covered more than two thousand miles in a single sortie; but the weather was

against them. They encountered strong head winds, fog, rain-squalls, and heavy cloud in which severe icing conditions developed. In addition to the Sunderlands, two Catalina flying boats covered the Iceland Channel, beginning their patrol at 1.0 p.m. They had to abandon their task when unbroken cloud down to three hundred feet accompanied by unceasing rain reduced visibility to less than a thousand yards.

That evening H.M.S. "Suffolk" sighted the German warships in the Denmark Strait and soon afterwards a Sunderland and a Hudson from Iceland set off in the long twilight of those far Northern latitudes to search for the enemy. The Hudson could not find them and returned. The Sunderland held on. In the meantime the "Bismarck" and the "Prinz Eugen" had also been seen by H.M.S. "Norfolk." Matters stood thus at the end of 23rd May. The two cruisers shadowed the enemy throughout the night.

Next morning another Hudson took off and at 5.54 a.m. sighted the "Bismarck" and the "Prinz Eugen" engaged in combat with the "Hood" and the "Prince of Wales." Low clouds made it impossible to identify the opposing forces with certainty, but it could be perceived that one of the ships had suffered two direct hits, of which the second was followed by an explosion.

Meanwhile the Sunderland from Iceland had arrived in the neighbourhood of the "Suffolk," and, on sighting this ship, saw at the same time the flash of gunfire well ahead. "As we closed," says the captain in his report, "two columns, each of two ships in line ahead, were seen to be steering on parallel courses at an estimated range of twelve miles between the columns. Heavy gunfire was being exchanged and the leading ship of the port column was on fire in two places, one fire being at the base of the bridge superstructure and the other farther aft. In spite of these large conflagrations she appeared to be firing at least one turret forward and one aft." At first the captain of the Sunderland could not identify the burning ship. He turned towards the starboard column and noticed that the second of the two ships composing it was making a considerable amount of smoke, and that oil escaping from her was leaving a broad track upon the surface of the



The "Prinz Eugen," spotted in Hjelte Fjord, ready for a commerce-raiding voyage with the "Bismarck" in the Atlantic.

sea. He approached nearer, and as he did so the ship on fire in the column to port blew up.

A few seconds later the Sunderland came under heavy A.A. fire at the moment when its captain was identifying the ships in the starboard column as the "Bismarck" and the "Prinz Eugen." He was forced to take immediate cloud cover and when, five minutes

later, he emerged into an open patch, the ship which had blown up, and which he now realised was British, though he did not learn until a little later that she was the "Hood," had almost completely disappeared. "Only part of the bows was showing." This sank almost at once, and when the Sunderland flew over the spot all that could be seen was an empty raft.

painted red, surrounded by wreckage in the midst of a large patch of oil.

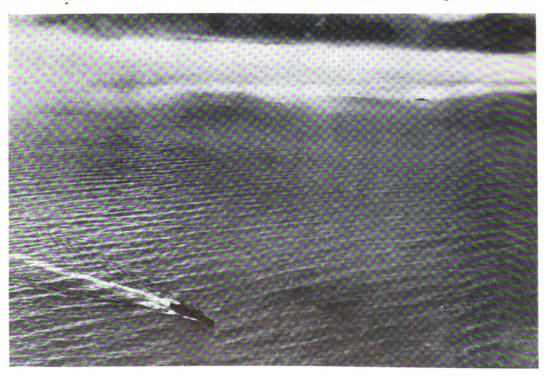
Watching the remainder of the action, the captain of the Sunderland saw the "Prince of Wales" turn away under cover of a "light smoke screen" and open the range to about fifteen miles. The Sunderland closed the "Bismarck" to make quite certain of her identity and then, returning to the neighbourhood of the "Suffolk," exchanged visual signals with her and learnt that the ship which had been sunk was the "Hood." It was then about a quarter past seven on the morning of 24th May.

Throughout that day the shadowing of the German ships by the Royal Navy continued. A Catalina of Coastal Command saw them at 12.32 p.m. and, remaining in contact for two hours, at intervals signalled their course and speed to the pursuers. Coming under anti-

aircraft fire, the flying boat developed engine trouble which forced it to return to base. This was the last contact with the enemy made by Coastal Command that day. The "Norfolk" and "Suffolk" with the "Prince of Wales" held on. The "King George V," in which the Commander-in-Chief of the Home Fleet was flying his flag, and the aircraft carrier "Victorious" were now rapidly approaching.

On board the "Bismarck" there was much rejoicing, not without good reason. She had damaged the "Prince of Wales." She had sunk the "Hood." That evening there was a large extra issue of sausage, chocolate and cigarettes, and Hitler conferred the Knight Insignia of the Iron Cross on the First Gunnery Officer. True, the speed of the ship had been reduced, for a shell from the "Hood" had partially flooded some of her compartments and had also made

"Good hunting" was the German admiral's message to his men. But the hunter became the hunted. A County Class cruiser, with H.M.S. "Prince of Wales" in the distance, is chasing the "Bismarck."



it impossible to use the oil fuel in the forward bunkers—it was this oil escaping from the ship which had left the broad stain upon the sea seen by the Sunderland—but a formidable unit of the British Fleet had been disposed of and another, still more formidable, had been damaged. Surely it was now time to return to the safety of the Norwegian fjords!

Captain Lindemann, in command of the "Bismarck," thought so; but he was overruled by his Admiral, who ordered the "Prinz Eugen" to part company while the "Bismarck" held on her course for a French port. Night fell without further incident, but soon after midnight torpedo-carrying Swordfish from the "Victorious," supported by Fulmars, delivered an attack in which a hit was scored on the starboard side. Survivors from the "Bismarck" subsequently spoke with surprise and admiration of the courage displayed by the British pilots. One Swordfish, they said, after being hit, still tried to get into a position from which to release its torpedo before plunging into the sea. The anti-aircraft fire of the "Bismarck" was tremendous, many of the guns becoming redhot. Our losses in this attack were two Swordfish and two Fulmars, the crews of the Fulmars being saved. It was put about on board the "Bismarck" that forty-seven British aircraft had been destroyed.

Soon after 3 o'clock that morning, 25th May, visibility became very bad, and contact with the "Bismarck" was at last lost by the cruisers "Norfolk" and "Suffolk," which had shadowed her so tenaciously since sunset on 23rd May. When last seen her speed had been reduced to 20 knots. It now seemed to the Admiralty that, in view of the damage which she had sustained and her heavy consumption of fuel, she would either double back on her track and return to Norway or make for one of the French ports in order to refuel and refit. Coastal Command did its best to meet both contingencies.

All that afternoon and throughout the night three Catalinas searched the area through which it was considered most probable that the "Bismarck" was steaming. They remained air-borne for 19 hours 36 minutes, 20 hours 54 minutes, and 22 hours 21 minutes respectively. They saw nothing of the enemy, though one of them passed over a warship in the dead of

night and was not able to identify it, low cloud making the use of parachute flares impossible.

During 26th May Hudsons patrolled the Denmark Strait all day in very bad weather, while Sunderlands, with the help of a Catalina and a Hudson, covered the passage between Iceland and the Faroes. None of these aircraft sighted the enemy. Units of the Royal Navy were taking up fresh dispositions. The main body of the Home Fleet was steaming at high speed in a South-Westerly direction from Northern waters. Another force, headed by the "Renown," was steaming North-Westwards at high speed from Gibraltar, while the "Rodney" and the "Ramillies," on escort duty in the North Atlantic, proceeded to move in the direction of the enemy.

On board the "Bismarck" the mood of exaltation occasioned by her victory over the "Hood" began to give way to one of anxiety which increased to alarm when, shortly before midday, Admiral Lütjens informed the crew that it had proved impossible to shake off pursuit and that, though aircraft and U-boats would be forthcoming as soon as the ship came within their range, an action would almost certainly have to be fought, in which case the best which could be hoped for would be that the "Bismarck" would take some of the British Navy to the bottom with her. Yet, as the day wore on, and no aircraft appeared over them and no hostile ships were sighted, their spirits rose again, especially when at evening they entered a U-boat area.

Dawn on 26th May broke over a heavy sea above which scudded broken clouds. During the morning the weather became somewhat hazy. At 10.30 a Catalina flying boat appeared above the "Bismarck." It had taken off from a base in Northern Ireland seven hours before and was one of two sent to patrol some five hundred miles out in the Atlantic almost due West of Land's End. Contact with the "Bismarck" had been regained after a lapse of thirty-one and a half hours.

This had been achieved by brilliant calculation on the part of the Air and Naval Staffs, whose plotting of the "Bismarck's" probable course was accurate enough to enable the Commander-in-Chief, Coastal Command, to design the pattern of his patrols so as to place them exactly where the enemy was most likely



The tell-tale wake of the "Bismarck," showing that the attack by Sword-fish aircraft has damaged her steering-gear and left her out of control.

to be found. The sighting of the "Bismarck" at this stage was, in fact, the second principal factor which ensured her destruction, the first being the reconnaissances which had found her near Bergen and then discovered that she had sailed.

"' George*' was flying the aircraft," said the

pilot, "at five hundred feet when we saw a warship. I was in the second pilot's seat when the occupant of the seat beside me, an American, said 'What the devil's that?' I stared ahead and saw a dull black shape through the mist which curled above a very rough sea. 'Looks like a battleship,' he said. I said: 'Better get closer. Go round its stern.' I thought it might be the 'Bismarck,' because I could see no destroyers round the ship and I should have

^{• &#}x27;George' is the nickname given by the Royal Air Force to the automatic pilot.

seen them had she been a British warship. I left my seat, went to the wireless operator's table, grabbed a piece of paper and began to write out a signal. The second pilot had taken over from 'George' and gone up to 1,500 feet into broken cloud. As we came round he must have slightly misjudged his position, for instead of coming up astern we found ourselves right over the ship in an open space between the clouds. The first thing I knew about this was when two black puffs appeared outside the starboard wing tip. In a moment we were surrounded by black puffs. Stuff began to rattle against the hull. Some of it went through and a lot more made dents in it. I scribbled 'End of message' and handed it to the wireless operator. In between the smudges of the bursting shells I looked down on the ship, which seemed to me to be one big, winking flame. She was taking violent avoiding action by turning hard to starboard, heeling well over."

The Catalina took similar action to dodge the A.A. fire. None of the crew was hit, though a piece of shell passed upwards through the floor between the two pilots as they were changing places. The only casualties occurred in the galley, where one of the crew, who was washing up the breakfast things, "dropped two china R.A.F. plates and broke them."

Touch with the "Bismarck" was temporarily lost, for the evasive action taken by the Catalina had removed her some miles from the ship. At 11.15 aircraft from "Ark Royal," now about 70 miles away, found her again, and another Coastal Command Catalina in the neighbourhood was diverted from its patrol area and reported sighting the enemy at 1.28 p.m. It kept the "Bismarck" more or less in view during the afternoon, though it lost her at intervals owing to the bad visibility. It had to return to base at 6 p.m.

Some three hours later an event occurred which was the final factor in accomplishing the fate of the "Bismarck." As will have been realised, she had been shadowed on and off by aircraft of Coastal Command or by naval aircraft throughout the day of 26th May. Three powerful forces of the Royal Navy were closing in upon her. At five minutes to nine in the evening, 15 Swordfish torpedo-carrying aircraft from the "Ark Royal" launched an attack. It lasted half an hour, and when it

was over the "Bismarck's" steering gear was wrecked and her rudders jammed at an angle of between 10 and 15 degrees, thus causing her to turn in circles. Throughout that fierce half-hour she put up a tremendous A.A. barrage, firing off practically all her A.A. ammunition. The Swordfish "darted through it like flashes of lightning" to score two and possibly three hits. No aircraft was lost, the only casualties being a pilot and an air gunner who were wounded.

The position of the "Bismarck" was now desperate. Despite all their efforts her divers, who were promised the Knight Insignia of the Iron Cross if they succeeded, could only free one rudder. The other remained jammed and immovable. That night destroyers, of which one was the "Cossack," went in close and delivered six torpedo attacks, scoring three more hits. Dawn on the 27th May found the "Bismarck" striving to make about ten knots. By now the main British force had come up, and at 8.45 a.m. the great ships opened fire. In less than an hour the "Bismarck" was a blazing wreck; but she did not surrender.



The kill. A battered, blazing hulk after many hits by gunfire and torpedo, the "Bismarck" is sinking.

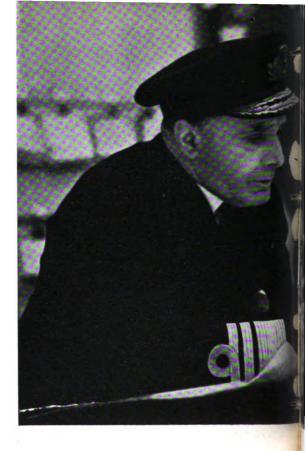
The coup de grâce was given by the torpedoes of the "Dorsetshire," and the "Bismarck" sank shortly afterwards with her colours flying.

Throughout the 27th and 28th May Hudsons of Coastal Command were busy escorting units of the Fleet moving back to their bases after the action. A number of combats, mostly with Heinkels, took place. During one of them, the British and German aircraft found themselves, after a spirited engagement over the sea, flying up a valley in Northern Ireland below the level of the hill-tops. Luck was with the enemy. A round of tracer ammunition became jammed in the breech of the Hudson's port forward gun, where it exploded, filling the cockpit with smoke. When the pilot could see clearly again the Heinkel had got away in the gathering darkness.

In another, the port gunner, whose gun had been knocked out of his hand, got it into action again, silenced a Heinkel's fire and forced its pilot to jettison the bombs. In a third, the Hudson's pilot, a Wing Commander, having used all the ammunition of his front guns, took up a position almost underneath the Heinkel with which he was engaged, and "by suddenly throttling back for an instant put his aircraft in a position from which the rear guns could be brought to bear. fifty yards then separated the two aircraft, and the rear gunner used his guns almost at pointblank range, spraying the Heinkel along its whole length until the port engine caught fire. Into that fire he poured everything he had got. The Heinkel burst into flames and crashed into the sea."

Soon after the "Bismarck" sank a message was received by the Commander-in-Chief of Coastal Command. "The Admiralty," it read, "wish gratefully to acknowledge the part played by the reconnaissance of the forces under your command, which contributed in a large measure to the successful outcome of the recent operation."

The story of the hunting and destruction of the "Bismarck" has been told at some length because it illustrates not only an important function of Coastal Command but also its close co-operation with the Royal Navy. On this, as on many other occasions, their combined efforts have discomfited the Germans.



As Chaucer said of the doctor and the apothecary: "Ech of hem made other for to winne." Together they seek out the enemy on the high seas to destroy him. Together they are striving to keep free the great ocean routes along which steam in convoy ships freighted with the commodities necessary for the successful prosecution of the war. Together they are denying such routes to the enemy by the maintenance of a strict and pitiless blockade.

These tasks the Royal Navy has performed in time of war for upwards of a thousand years, Coastal Command for scarcely a thousand days. But if the weapons it uses are something new in the history of the world, if the craft it mans traverse the fields of air rather than the fields of ocean, the object it intends to achieve is the same. It can be summed up in nine words: Find the enemy; strike the enemy; protect our ships. How Coastal Command performs this triple task it is the aim of this account to show,



2: Plot of Operations

HOW COASTAL COMMAND IS ORGANISED

IN ITS PRESENT form Coastal Command is the development of Coastal Area of the Royal Air Force, formed in September 1919 "to control all air units working with the Navy." Its main functions were to be: first, the study and development, in close relationship with the Admiralty, of all aspects of air co-operation in a war at sea; secondly, the eventual adminisClose co-operation between the Royal Navy and the Royal Air Force is the secret of Coastal Command's success. The Naval Commander-in-Chief, Rosyth, with the Air Officer Commanding, directing an operation upon the Norwegian coast.

tration of the Fleet Air Arm on land, including the training of its units when on shore; and, thirdly, the development of Service Flying Boats of which the duties would be to defend the trade of this country and to maintain communications with all parts of the Empire.

In 1937 the administration of the Fleet Air Arm was removed from Coastal Command and was placed under the Admiralty for all purposes. The effect of this change was to cause the principal task of the Command to be the provision of trained shore-based squadrons for the defence of trade and for co-operation with the Royal Navy in home waters. To provide them was not easy. The international scene was becoming more and more confused. Across it passed processions of tortured figures holding one thing in common in addition to their common humanity—fear. Gas-blistered Abvssinians were succeeded by homeless and starving Chinese, who in turn gave place to sombre Europeans, fugitives from countries which had either been used as a practice battlefield by the armed forces of two irresponsible dictators or were about to suffer at their hands a form of alien protection indistinguishable from slavery.

To discerning eyes—and there were many it was apparent that Great Britain would soon once more be fighting to keep safe and open those routes across the ocean which are vital But in this field as in all to her existence. others there was much that remained to be done in order to cope with war on a world-wide scale. Nevertheless, steady progress was made. General reconnaissance squadrons were formed and trained. Modern flying boats, such as the Sunderland, were slowly forthcoming for their equipment. The Anson, that most useful and dependable of aircraft, came into service in increasing numbers; American-built Hudsons began to make their appearance.

There was one achievement of major importance. Co-operation with the Royal Navy,

which from the outset had been close, became the watchword of Coastal Command. It was laid down as a principle that the ultimate decision concerning any operation must rest with the Royal Navy, whose duty it is to fight and win wars at sea. This did not, and does not, mean that Coastal Command should have no initiative of its own. Far from it. But the operational requirements of the Admiralty must come before all else. This is realised to the full, and close and harmonious co-operation with the Royal Navy is the happy result. How it is achieved is best seen by examining the organisation of Coastal Command.

At the centre is Headquarters, where the Commander-in-Chief is in constant and immediate touch with the Admiralty. This is maintained by Naval Officers stationed at the one place and Royal Air Force Officers stationed at the other. Each keeps the other "in the picture" throughout. The Command is divided into Groups whose geographical boundaries conform to those of the Naval Commands on shore with which they are associated. They cover the whole of England, Scotland, Wales and Northern Ireland. There is a separate group in Iceland and a station at Gibraltar.

Each Air Force Group and Naval Command possesses an Area Combined Headquarters where the Operations Room, common to both Services, is situated. The Army staff responsible for the anti-aircraft and other defences are normally part of headquarters. The Air Officer Commanding the Group, usually an Air Vice-Marshal, has his office next to that of the Naval Commander-in-Chief, who is an Admiral or a Vice-Admiral. They fight their part of the war together. If, for example, the Commander-in-Chief of the Home Fleet requires air support or a special reconnaissance, he asks for it through the Flag Officer Commanding the nearest Area Combined Headquarters, who passes on the request to his Air Force colleague. If for some reason—such as lack of aircraft available—the request cannot be met, it is referred at once to the Air Officer Commandingin-Chief, Coastal Command, who takes action.

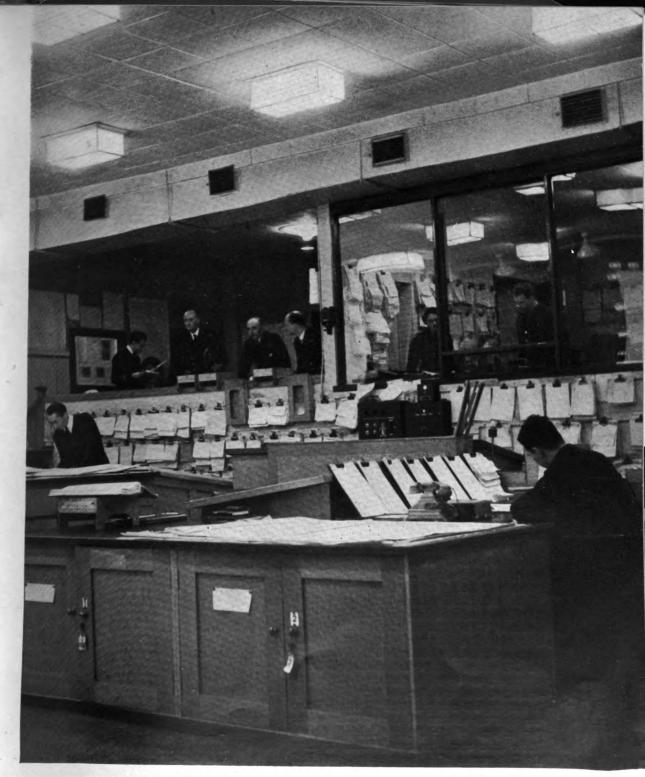
All essential information and operational instructions given and received by Head-quarters and lower formations pass through a special communications system common to the Royal Navy and the Royal Air Force, and

manned by ratings and aircraftmen, Wrens and Waaf. This system feeds both Services simultaneously. For example, the Form Green, as it is called, on which the orders for an operation—an attack on enemy shipping, an anti-submarine patrol, or whatever it may be—are set out, goes at once to the Naval and the Air Force Commanders and units concerned. This process is repeated with the Form Orange, on which the result of the operation is recorded after the crews who have carried it out have been interrogated at their Station by the Intelligence staff.

The Operations Room of an Area Combined Headquarters is of standard pattern. Some of them are sunk many feet deep underground and are approached by long flights of steps. All are surrounded by groups of offices containing the various branches of the staff, Intelligence, Signals, Cipher clerks, telephone and teleprinter operators and the rest. All rooms are airconditioned.

Let us take as an example the room belonging to the Group most directly concerned with the Battle of the Atlantic. It is large and lofty, oblong in shape, and bright with a soft reflected light. Along the whole length of one of the longer walls is a huge board on which is painted the map of the Atlantic. The land is coloured brownish yellow and on it are marked the Stations belonging to the Group, the harbours used by the Royal Navy, and such Stations of Fighter Command as are in the Area.

On this huge map, some sixteen feet high and thirty feet long, the Battle of the Atlantic is shown in full detail, so that the exact position at any moment can be seen at a glance. The details thus visually recorded are known as the "plot." Each convoy and the nature of its escort, both sea and air, is marked with the appropriate symbol and its route by elastic strings of different colours. The position known or suspected of every U-boat is also shown, as are those of our own submarines and surface vessels. The spot where an attack by Focke-Wulf, U-boat or surface raider has been made or where a ship has been sunk is similarly recorded. If a U-boat is sunk, the symbol representing it on the "plot" is turned upside down. Cardboard arrows indicate the speed and direction of the wind.



At Area Combined Headquarters, Naval and Air Force officers work side by side, in two offices fronting the "plot" on which every new movement in the Battle of the Atlantic is recorded.

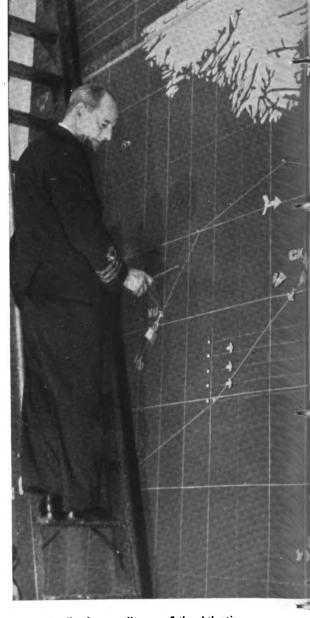
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In front of the "plot" is a tall step-ladder running along steel guides. It is used by the Naval and Air Force personnel, Wrens and Waaf, when symbols out of reach from the floor have to be moved or changed.

On each side of the main board are two smaller boards recording on the right information about convoys and their Naval escort, on the left information about aircraft. The information on these boards is written in chalk of various colours. All of it and that on the "plot" itself is collected and checked by the duty officers and their staffs, who work in two offices fitted with desks and telephones fronting the "plot," the Naval to the right, the Air Force to the left. There is a partition between the offices with a hatch through which messages can be passed at once by hand. Above these offices are those of the two Naval and Air Commanders similarly situated and constructed. One wall of each office, that giving on the "plot," is of glass, so that both can tell at a glance the fortunes of this long, relentless battle.

The layout in the Operations Room of the Area Combined Headquarters of the other Groups is the same, mutatis mutandis. In one the North Sea and fjords of Norway take the place of the Atlantic and the East coast of America, and the information concerns "strikes" instead of convoy protection; in another are depicted the Bay of Biscay and the changing areas where bombing attacks may be made, and where they may not lest the submarine be one of our own.

The Operations Room at Coastal Command Headquarters is, naturally, the largest of all, for on its boards and charts is set out all the information shown separately in the rooms of the various Area Combined Headquarters. All Operations Rooms are manned continuously throughout the twenty-four hours by staff divided into watches. In each watch there are the Controller and his Assistant, the Naval Staff Officer and his, a navigator, a plotter, telephone, teleprinter and wireless operators, and members of the Signal, the Meteorological and the Records staff. There are also the officers of the Air-Sea Rescue Service and of the Flying Control system. These have now been amalgamated to form the Directorate of Aircraft Safety, and deal



The "plot," a huge wall-map of the Atlantic, where the position of convoys, escort vessels and enemy raiders can be seen at a glance.

Coastal Command officers at work during an operation. Through the glass wall of their office the watch the fortunes of battle recorded on the "plot."

with all aircraft in distress, of whatever Command. The Flying Control Officers try to bring the aircraft back to its base if it is off its course, or to divert it should its home aerodrome be unserviceable for some cause; the Air-Sea Rescue Service controls the organisation for finding the crew in or on the water and bringing them safe to shore.

The smooth working and efficiency of the various headquarters of Coastal Command depend very largely on a rapid, sure and secret system of communications. These are ensured, in so far as telephones and teleprinters are concerned, by officials of the Genera! Post Office, whose high standard in peace is surpassed in war. The essential requirements in addition to speed are the maintenance of secrecy and that breakdowns shall be few and

of very short duration. Delayed and wrongly addressed messages are few and far between. In one Group their number is about one in thirty-three thousand, and this is a fair average throughout the Command.

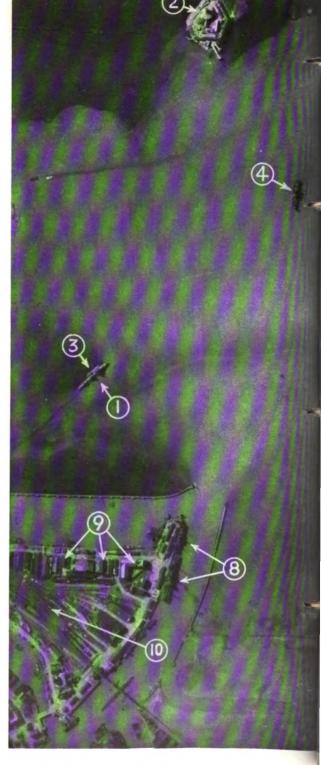
Attached to Headquarters, to Groups and to Stations is a section of meteorologists. They are for the most part civilian experts, but there are also serving officers and Waaf among them. It is their duty to provide weather forecasts for the Commander-in-Chief, the Commanders of the Groups, and for the crews detailed to carry out the operations planned. The importance of their task needs no emphasis. The state of the weather, always a cardinal factor in flying, assumes—special significance when the aircraft has to remain long hours over the sea and when its usefulness,

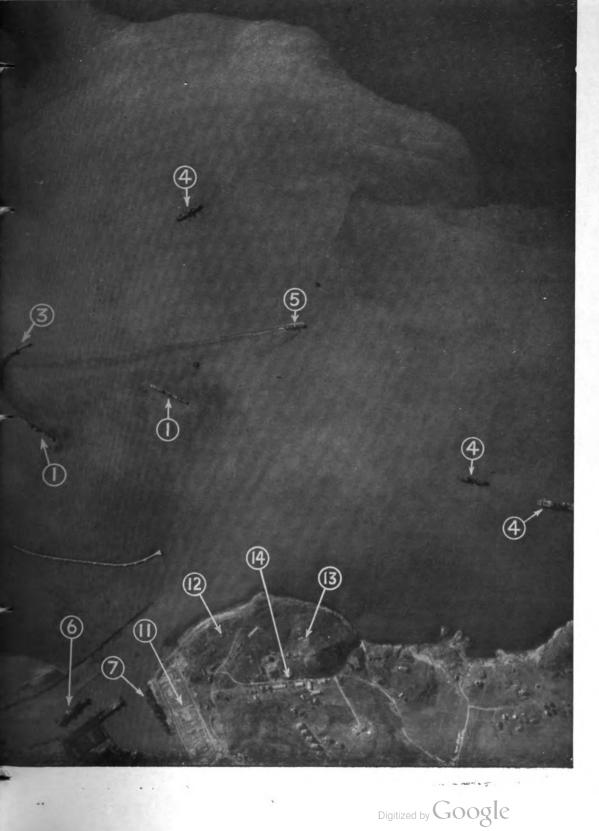




Intelligence Room at an Area Combined Headquarters. Here, information from the air-sea front line is received, sifted, interpreted, pieced together.

The interpretation of photographs is one of the most important tasks of Coastal Command Intelligence. This photograph of Trondhjem revealed the presence of three German destroyers (1) in the roads: the arrival of destroyers, which were seldom seen in Trondhjem at this time, was connected with the sortie of the "Bismarck" and "Prinz Eugen" on the next day. Other interesting details are:—
(2) The island of Munckholmen, heavily defended with gun and searchlight positions; (3) oil tankers, one alongside, one moving away from, a destroyer; (4) merchant vessels; (5) a coaster; (6) a motor vessel in the harbour; (7) a "Huarasean" type cargo-liner, used as a depot ship for U-boats; (8) two large motor vessels; (9) warehouses on the quay; (10) railway traffic yard; (11) a rectangular site, foundation for six large buildings to be constructed in connection with the German naval base; (12) a coastal battery; (13) a flak position; (14) huts for personnel of the batteries.







"A good Intelligence Officer must have something of the qualities of Herodotus, Socrates and Voltaire." He must be tireless in collecting facts, expert in checking them, concise in presenting them.

indeed its only justification, lies in the ability of the crew it carries to see what they have been sent forth to see—the convoy which must be protected, the submarine which must be slaughtered, the enemy surface vessel which must be bombed or torpedoed.

At all Headquarters the Met. Officers keep a 24-hour watch. There is always a fore-caster on duty with a number of assistants, among them members of the W.A.A.F. specially trained for Met. duties. These give forecasts and other meteorological advice to all entitled to receive them. The Met. Officers keep a series of weather or synoptic charts, as they are called, altered every three hours and covering an area which includes not only the vast field of operations of Coastal Command but indeed practically the whole world. Pressure systems are plotted and their movements traced and recorded.

The difficulties of a forecaster are greater in war even than they are in peace, for weather

reports from ships are no longer available since wireless silence is maintained. Much of their knowledge is derived from the information gained from the "Met. flights." These are flown day in, day out, over certain areas of sea. The pilots of the aircraft used, mostly Blenheims, have had many adventures. They have fought and vanquished Ju.88s, they have attacked U-boats. They fly in all weathers. One of them once landed with a gorse bush collected from a hill-top jammed in the wing of his Blenheim. The data they collect contribute in no small degree to the accuracy of the forecasts.

The forecasters have daily, often hourly, personal consultations with the Controllers at Group Headquarters and also with their own officers at the stations. Perhaps the most frequent question to be answered is: "Will the weather at base be suitable for landing when the aircraft on patrol returns, and if not, which is the most likely alternative base to

which the aircraft can safely be diverted?"

A word must also be said about the kind of work covered by the term "Intelligence." This ranges from the Operational Research section at Headquarters, in which officers and scientists together seek the solution of tactical problems, to the Station Intelligence Officer who briefs the crews and interrogates them when the patrol or sortie is over. "Pure" intelligence, as distinct from that arriving through channels to be broadly described as "secret sources," is derived from photographs. These are of great and sometimes, as in the case of the first and last voyage of the "Bismarck," of the greatest importance. Some of those accompanying this record will give an idea of their value. Every Station, every Group, and the Headquarters itself of Coastal Command have photographic sections where many thousands of operational photographs are the subject of close study. It is the general rule for aircraft of the Command to carry cameras which record anything of interest that may be seen in the course of a patrol.

As soon as an aircraft has landed, the films are taken to the Station Photographic Section, processed and delivered to the Station Intelligence Officer within an hour and a half. Those of particular interest are sent to Group or Command Headquarters and subsequently to the Air Ministry. Processing calls for expert knowledge and is carried out by a specially trained staff, many of whom were professional photographers in the days of peace. Mosaics, which are photographic maps, are made from a large number of individual pictures. result is an absolutely accurate map of the temporary or permanent "abodes of the guilty." Pictures, too, of enemy shipping go to swell the considerable gallery of targets kept on every Station. With all these the Intelligence Officer must be familiar. They are an unfailing and invaluable source of knowledge.

A good Intelligence Officer must have in him something of the qualities of Herodotus, Socrates and Voltaire. He must be avid for the collection of facts, expert in sifting the true from the false, concise and convincing in his presentation of them. It is his unending and not unworthy task to pursue knowledge of the enemy, his habits of warfare on land, sea, and in the air. He must know, or be able to

find out without delay, all about enemy ships, their dimensions, armament, cargoes, about the convoys in which they sail and the ports they use and why, about enemy aerodromes and the aircraft based on them, about guns, balloons and other defences surrounding the targets chosen for attack, about the targets themselves, the ports, harbours, factories, barracks, wireless stations, oil dumps, everything that constitutes a military objective within range of Coastal Command. He must be able to identify ships from photographs, sketches, the written and verbal reports of pilots. He must, with the aid of the Royal Navy, always and instantly forthcoming, become an authority on E-boats, U-boats, destroyers, cruisers, every kind of craft up to and including pocket-battleships. He must be able from his knowledge to give advice on tactics, from the best way to approach a heavily defended port like Brest to the most effective method of bombing a ten-thousand-ton tanker. The information he receives and the knowledge he acquires are constantly changing as the war develops. There is about his duties nothing static, and this flexibility is part of that which is a chief characteristic of the organisation as a whole.

It is flexibility and the practice of close co-operation with the Royal Navy which are the twin hall-marks of Coastal Command. Its forces are not only sent into action instantly, they can be switched to any desired point with a speed never before achieved in warfare. They join with ship-borne naval aircraft in extending the vision and striking power of the Fleet. Though they are not everywhere at once, they are moved huge distances at great speeds. A Catalina or a Sunderland may on Monday be flying on the ice patrol above the Denmark Strait with "Greenland's icy mountains" on the horizon, and on Wednesday be rocking at its moorings in the sunny harbour of Gibraltar. A Hudson which has sunk a ship in Aalesund may two nights later be bombing a U-boat hundreds of miles West of Land's End.

The Royal Navy and Coastal Command are two separate Services with one common object, the defeat and destruction of the enemy. The men and women who serve in them wear uniforms of blue cloth. Those on the backs of the Royal Air Force are of a lighter shade. That is all the difference.





3: The Men and the Aircraft

BEFORE RECORDING the deeds of the pilots and crews of Coastal Command, something must be said of their training, their environment, and of the aircraft they fly.

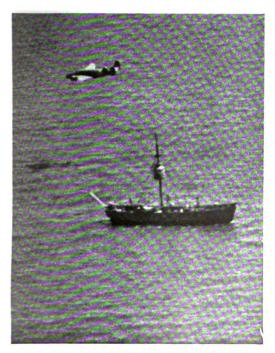
In temperament the General Reconnaissance pilots and crews resemble their comrades in Bomber rather than those in Fighter Command.

This is natural, for their duties have this much in common-they involve flights of many hours' duration in almost all weathers, and during much of that time the main preoccupation must be whether the aircraft is on its right course or not. Then, however, the resemblance grows thin. The crew of a bomber are concerned to find a target, which is usually stationary, and to hit it with their bombs; those of an aircraft of Coastal Command have first to find what is very often a moving target and then to hit it, or to keep it under observation so that a striking force may do so. Moreover, if they are on convoy protection and this form of patrol is one of their main duties and entails the spending of many thousands of hours in the air and the covering of many millions of miles over the sea-they

may never see a target at all, though they must constantly be on the look-out for one. They are therefore, generally speaking, of the phlegmatic turn of mind.

They must find their way by methods of precision, relying on instruments for their guidance. There are no landmarks five hundred miles out in the Atlantic, and they may not see land of any kind for nine-tenths of their patrol. There is bred in them much of the sense of direction possessed by the sailor or —it is almost possible to say—by the homing pigeon. Yet this power to find their way with precision and certainty over vast spaces of water, tracked only by the changing lanes traced upon its surface by the wind or by the spume of unnumbered waves, is an acquired faculty, the much-hoped-for result of months of practice and hard work.

"Ability to navigate accurately," runs a passage in one of the reports of their first Commander-in-Chief in this war, "is, I consider, one of the most important qualifications



He protects the lightships from the vilest of all the assaults the enemy is making at sea.

of the General Reconnaissance pilot, and my training policy has always been framed with that end in view." So pilots and crews are trained from the first day of their career to have implicit faith in their navigational instruments—above all in the compass. To inculcate this requires patience. It is a natural tendency for the eye to look outside the cockpit straining to pick up some solid object which will give a guide to the position of the aircraft.

It was not easy, especially at the beginning of the war, to induce in the minds of the pilots and crews the belief that in the compass lay their safety; but as the days and weeks passed they became aware and now fully understand that it is dead reckoning which will bring them back to base and that no member of the crew, whether he be pilot, navigator, wireless operator or gunner, can lay claim to be a trained man until he knows, not in his head only but also in his heart, the true meaning of this phrase and all that it implies.

Once this lesson is learnt, this faith acquired, the result is immediately apparent, and it is a remarkable experience to witness the return of a young pilot and his crew from their first sortie in bad weather, when, having carried out all the drill learnt during long hours of instruction, they find that they are safely back in the Mess. They can then begin to feel—and, being young, to show—that joy and pride in achievement which is the reward of trained men.

It will thus be seen that pilots of Coastal Command flying boats must possess many of the qualities of the sailor. The young pilot in the early days of his training, unless he has had previous experience of the sea, is not infrequently found to stand in some awe of the Navy. He is brought into close association with a Service which acquired the title "Royal" in the reign of King Henry VIII, and whose victories have changed the course of history not once but many times. Soon, however, he perceives that, belonging to a younger Service, he has, nevertheless, a share in the tradition of an older, that he has much in common with those who go down to the sea in ships, and that, though he may behold the wonders of the Lord from a somewhat different angle and from some hundreds of feet nearer heaven, he is none the less of their company

and is admitted by right of his calling to their fellowship.

This should, indeed, be so; for a great part of his training has a strong naval flavour. He must know almost as much about seamanship as he must know about airmanship. He must be able to handle and control a machine which is both an aircraft and a surface vessel. It is moored to a buoy. It carries an anchor. Its instruments are calibrated in knots, for its speed is calculated in sea, not in land, miles, and this is so with all aircraft of Coastal Command, whether they are designed to take off from and alight on land or water. He must have a sound working knowledge of tides and currents. He must acquire an eye for weather, with all that that implies. He must feel at home in a small boat. He must read a chart as a bomber pilot reads a map. He must be able to recognise ships of every sort and kind and in every condition of visibility.

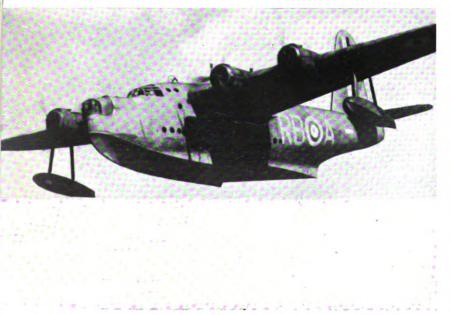
Lighthouse keepers are his friends, and the crews of lightships, whom he still protects from the vilest of all the vile assaults which

the enemy is making at sea. He cannot hear the seagulls crying, but the flash of their wings may bring him to an open boat freighted with shipwrecked mariners or to a rubber dinghy holding a crew whose aircraft has come to grief over the sea. It is when he sees seagulls walking upon the water that he must, according to a saying of the Service, beware, for then the water is land, and to put down a flying boat on land . . .

His chief enemy is not the German Luftwaffe or the German Navy, but boredom, which may provoke first inattention, then indifference. He must spend hundreds of hours with nothing to look upon but the expanse of sea and sky. "Wave, on wave, on wave to West" stretches the vast monotony of the Atlantic Ocean. It may glitter in the noonday or lie devoid of light and colour in the hour after sunset and before dawn; it may seem to crawl like the wrinkled skin of a beast or stretch in ridged and uneven furrows under the breath of strong winds; but it will be empty for hours.

The aircraft quarters it, moving in squares of which each side is ten miles long. Its crew,

Some of the aircraft used by Coastal Command





even if it be a Sunderland, have less room in which to move than is to be found in a small fishing smack. They are looking for a convoy four, five, six hundred miles out, or what is far more difficult, for a single ship. The one or the other is sighted and the protection patrol begins, enduring for as long as there is enough light or enough petrol. Then comes the long journey back to base.

The General Reconnaissance pilot and his crew may envy their comrades leading a life of high adventure in a squadron of torpedocarrying Beauforts in the Channel or of Hudsons striking at shipping off the Norwegian coast. These are flown by men who have passed through the same training as themselves, but who have had the good fortune to be given duties of a more exciting kind. They envy them, but that is all. They know better than anyone else the full importance of their task: for theirs are the eyes which catch the first glimpse of the great convoys carrying the food and the weapons of war needed to prosecute the fight and achieve the victory. They watch the ordered lines of merchant ships crossing a vast and vital battlefield. Over this they fly in fulfilment of a task which may be grim and is certainly not gay, but which is slowly and surely winning a decisive battle. "Set me some great task, ye gods! And I will show you my spirit. 'Not so,' says the good heaven; 'plod and plough.'" So writes a philosopher of the New World. The General Reconnaissance pilots and crews of Coastal Command pay daily heed to this advice.

To provide and maintain a balanced air force, one, that is, in which a true proportion exists between land- and sea-borne aircraft, has ever been the aim of Coastal Command. Adaptable though the modern aircraft has proved to be, it cannot be used for all purposes, nor can one type entirely take the place of another. In general, land-borne aircraft are used for attack and for reconnaissance, while sea-borne, having a greater range and endurance, are more suitable for long-distance reconnaissance and for convoy protection far out in the Atlantic. It is by the judicious use, both strategical and tactical, of each main type that success is achieved.

The aircraft flown on general reconnaissance





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LIBERATOR





BEAUFORT TORPEDO-BOMBERS

and convoy protection are some of them land aircraft, some of them flying boats. The first are the Anson, the Wellington and the Whitley, the two last specially adapted for flights of long duration over the sea. These are all British-built. At the beginning of the war among the land aircraft the Anson was the main standby. It has now been almost entirely replaced by faster aircraft, but the services it rendered to this country were of the greatest value. Though not fast, it was very reliable and easy to manœuvre, and these qualities were summed up by the Command in the phrase, "Anson is as Anson does."

From the start, American-built Hudsons were put into service as fast as they could be procured. The Hudson has a good range, is well armed and has a wide field of vision.

The American-built Liberator has only recently been allotted to Coastal Command. It is capable of long flights far out into the Atlantic. Being well armed with gun-turrets, it can attack and destroy the prowling Focke-Wulf, and being fitted with depth charges it can deal effectively with U-boats.

The Wellingtons and Whitleys in use for reconnaissance are converted bombers. They are doing valuable service both by day and night.

At the beginning of the war there were three main types of flying boats in use—the Stranfaer, the London and the Sunderland. All these were British-built. The Stranraers and Londons, after doing excellent work in the first fifteen months of the war, were withdrawn from squadrons early in 1941. The Sunderland has a very wide range and an armament formidable enough for it to be nicknamed the "flying porcupine" by the Germans. It is the largest aircraft in use by Coastal Command and can almost be described as commodious. Meals can be cooked on board and there are bunks where those of the crew not on watch can sleep very comfortably. So much so that once a Sunderland dropped depth charges on a U-boat, and the second pilot, at rest and asleep at the time, knew nothing about the attack until he came on watch again an hour or so later.

Another flying boat almost as large as the Sunderland is the American-built Catalina. It first came into operation in March 1941, and is in constant and increasing use. It is a great standby and for long-distance patrols has few equals. One of these craft remained more than twenty-six hours in the air during the operations which ended in the sinking of the "Bismarck." In winter and bad weather it not infrequently happens that a Catalina returning in darkness to its base after an eighteenhour patrol, and finding it obscured by fog or low cloud, remains aloft all night until it

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ANSONS WHITLEY

can come down in greater safety by the light of dawn.

Other types of seaplane which have been used are the Lerwick flying boat and the Northrop float-plane.

The pilots and crews of torpedo bombers and long-range fighters undergo the same training as those engaged primarily on reconnaissance duties. No special distinction is made between them; but, since the duty of Coastal Command is as much offensive as it is defensive, its pilots are ready at any moment to strike at the enemy with torpedo, bomb and machine-gun. The target of the torpedo is a ship, either a naval vessel or a supply ship; that of the bomb may be the same or may be a "fringe" target—one that is situated on or near the coast, a factory or a dockyard, or ships at anchor in a harbour, or a gun-emplacement or a wireless station or troops at drill.

The pilot of a long-range fighter is mainly concerned with getting close enough to the enemy bomber to bring it to action. His is in the nature of a roving commission. He is not directed from the ground on to an enemy formation previously discovered by radio-location or by other means. He must seek out the marauder, usually a single aircraft itself seeking a convoy or more often a straggler from a convoy. Frequently he is called upon

to give protection to ships of the Royal Navy operating in or near enemy waters, and he must then be ready to encounter enemy fighters faster and more heavily armed than his own aircraft, which has to carry enough petrol to take him to the scene of operations and back again over many miles of sea.

It will thus be seen that, though superficially the offensive role of Coastal Command

NORTHROP FLOAT-PLANES





CATALINA

is the same as that of the other Commands, it is in practice more difficult to carry out and requires not only daring and resolution but a special degree of skill.

The aircraft used are, for torpedo attack the Beaufort, for bombing the Wellington, Whitley, Blenheim, and most often the Hudson, for long-range fighting the Beaufighter and the Blenheim. At the beginning of the war the Vickers-Armstrong Vildebeest was used as a torpedo-bomber, but was replaced in squadrons by Beauforts during 1940.

Operating under Coastal Command have been various types of aircraft belonging to other Commands of the Royal Air Force and various types of naval aircraft. For example, Battle bombers and Hurricane fighters have been used. So, too, have Swordfish, Albacores, Skuas and Rocs of the Fleet Air Arm when its squadrons have been attached to the Command for operations.

Before leaving the subject of the pilots and the aircraft, a word must be said about the members of the crew and about the maintenance staff. The work of the navigator will be described later. It is supplemented and completed by that of the wireless operator and the air gunner. A thorough knowledge of wireless is of great use and importance, and all wireless operators receive a specialised training. This must indeed be so in a service of which so much of the work is reconnaissance.

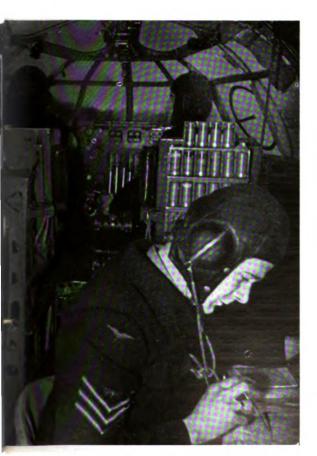


Pilots, navigator and radio operator in a Catalina. The airman of Coastal Command is half a sailor.



The air gunner in Coastal Command is not only a gunner, he is also a wireless operator and may be trained in navigation.

The ground crews are concerned as much as are those of Fighter and Bomber Commands to maintain their aircraft and its engines in perfect condition. In the big flying boats the engine fitters and riggers are members of the crew and take part in all their flights. As in the other Commands, logs are kept of the performance of the engines, and it is not unusual for the ground staff to interrogate a pilot and his crew on their return and demand a detailed report on the behaviour of their aircraft so as to make sure that it was airworthy.



He navigates over great tracts of ocean. His flying boat carries an anchor and is moored to a buoy.

With men and aircraft such as these, Coastal Command is carrying on its triple task of reconnaissance, protection and attack. This triple task has a double object—to prevent the enemy from imposing his blockade and to help in imposing our own.

Whenever it is possible Coastal Command follows the old principle that attack is the best defence, being ever mindful of the words of Drake in his dispatch of March 1588: "The nation will be persuaded that the Lord will put into Her Maiesty and her people courage and boldness not to fear invasion, but to seek God's enemies and Her Majesty's where they may be found." Its activities are thus at once defensive and offensive, and the line dividing them is often hard to perceive. What fortune has attended them will now be set down. It is a tale of the sea, the wind and the sky, and of men who, careless of the friendship or hostility of the elements, keep watch and ward by day and night, ready to attack and destroy a formidable, unscrupulous, but not invincible foe.





4: Flying Start: September 1939

COASTAL COMMAND began this war with one advantage. It had been fully mobilised a fortnight before the outbreak of hostilities. This was due to a fortunate circumstance. The authorities had decided to carry out an extensive exercise during the last fortnight of August 1939. For this purpose a large number

of officers on the Reserve had been recalled and they were all at their posts when war broke out. Many patrols were in the air over the North Sea, the Channel and the Western Approaches when they received a wireless signal notifying them that Great Britain was once again at war with Germany. The old warfare between sea and land power had broken out again; but now a third element, air power, was to be added. It had made its début in the war of 1914-1918.

On the outbreak of war the oceans of the world were being traversed by many hundreds of ships laden with goods for this country. They were not sailing in convoys, for they had left port while there was still peace. Profiting from the experiences of the war of 1914-1918, the Admiralty decided to institute the convoy system immediately. There was, however, an inevitable time lag between the moment when the decision was taken that all vessels below a certain speed sailing to and from these shores should proceed in convoy, and the moment when they actually began to do so. They had to be collected before they could be protected.

Moreover, many of them belonged to European States at that time neutral, and very eager to remain so. Such ships were in immediate peril, for Germany lost no time in putting into practice the plan which had so nearly brought her victory in the spring of 1917, and began to sink at sight any ship. whatever its nationality, which ventured to carry a cargo to Great Britain. Vessels belonging to the United States of America were at once forbidden by their Government to enter the combat zones. Such States, however, as Belgium, Holland, Denmark and Norway hesitated to incur the financial loss entailed by the adoption of such a policy, and continued to allow their ships to sail the North Sea. As the autumn of 1939 faded into winter they began to accept the protection of the convoy system, deeming the actions of the German Admiralty to be a greater peril than the threats of the German Foreign Office.

To meet the menace of the U-boat, Coastal Command had at its immediate disposal five Flying Boat Squadrons, seven Anson, two Vildebeest and half one Hudson Squadron. On the day on which war broke out there were,



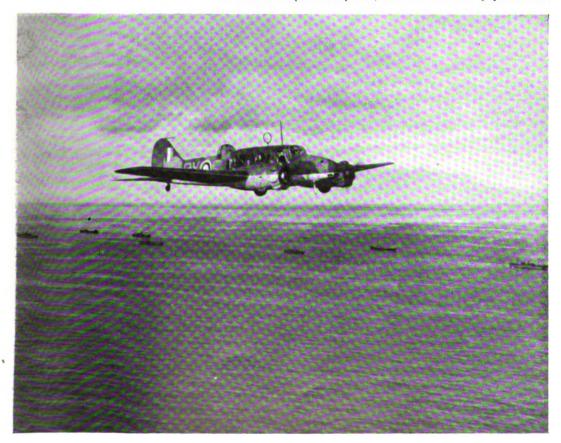
in fact, 171 aircraft available for action with their crews. Its work of protection was therefore limited in range. The flying boats went out farthest from bases in Wales, Devon, Cornwall and the Shetlands. They were capable of covering great distances, and they did so. On 26th December, 1939, for example, a Sunderland made what was then a record by picking up the convoy it was sent to cover 364 miles from its base.

Beyond their range protection was provided by the aircraft carriers of the Royal Navy. In doing so, their aircraft covered 7,516,550 square miles in the first four months of war. Without them our position in the Atlantic would have been serious.

As the merchant ships drew nearer to these shores they came under the protection of the spider-web patrols of Coastal Command which were flown over the approaches to Great Britain, especially those of the South-West. They were carried out by aircraft of limited range and endurance, the principal among them being the Anson.

The patrols along the East coast of Britain were for some months carried out by Tiger and Hornet Moths with an endurance of about two hours and a half and a petrol

"Anson is as Anson does." These aircraft were Coastal Command's main standby in the earliest days of the war. Reliability and powers of manœuvre particularly adapted them for convoy protection.



capacity of fourteen gallons. The object of these patrols was to protect coastwise shipping and to spot submarines on their way out North about these shores to the Atlantic. The presence of an aircraft, even of a Moth, made it impossible for U-boats to travel on the surface in daylight. The Moths ran considerable risks. The weather was often bad, and grew steadily worse as the weeks went by. "Left patrol area," says the report of one pilot, " on account of deteriorating weather conditions.... Contents of bottom of pigeon's basket were blown back into cockpit, affecting eyes." In one winter month 698 hours on patrol were flown by these Tiger and Hornet Moths.

In addition to the ocean convoys there were also the coastwise convoys to be protected. These passed almost daily through the Channel and up and down the East Coast. The practice was for the aircraft to meet the convoy at a chosen rendezvous and then to circle it for several hours before being relieved by another aircraft or by the approach of darkness. Stragglers had constantly to be rounded up.

The work of patrol and convoy protection was not carried on without opposition from the Luftwaffe. The Command fought many combats between 3rd September, 1939, and the end of the year. As a general rule they were indecisive. That which was fought on the 19th December, 1939, between a London flying boat and a Heinkel 111 is typical. The London, though much slower and without the advantage of position, set the starboard engine of the Heinkel on fire. A burst from the German aircraft, however, mortally wounded the British pilot, who, falling inert over the controls, sent the London into a steep dive. The second pilot dragged his captain from the steering column and righted the flying boat just in time to make a landing on to heavy seas. The Heinkel, damaged, flew away. The London, after twenty minutes on the water, took off again and completed its patrol.

The first time a Short Sunderland flying boat was in action it gave a very good account of itself. On the 3rd April, 1940, a Sunderland covering a convoy outward-bound for Norway encountered six Ju.88s. The fight was divided into two phases. The first lasted less than three minutes. Two Ju.88s, a hundred feet above sea-level, were engaged by the Sunder-

land's beam and rear guns. The enemy broke off the engagement and climbed to 1,500 feet, where they remained. Five minutes later four more Ju.88s dived in succession on the Sunderland's tail. The rear gunner held his fire until the leading Ju.88 was within a hundred yards, then he opened up. The enemy broke sharply away and fell in flames. The second to attack was also hit, and subsequently crashed



Aircraft v. Magnetic Mine. Wellingtons were fitted with a device for exploding the magnetic mines laid by the enemy in our waters. This mine-sweeping from the air was a hard and hazardous job.

in Norway, where the crew were interned. During this combat the two Ju.88s which had been circling above the flying boat dropped bombs upon it. They missed, and all the enemy aircraft made off home. The Sunderland was but little damaged.

In this early fighting the Ansons took a large share. On 8th November, 1939, for example, an Anson fought two Do.18 flying boats, forcing one into the sea, while another Anson on patrol encountered an enemy aircraft, fired the moment the pilot saw the black crosses

on its wings, and with the first burst sent it straight into the sea, where it broke up and sank before its type could be identified.

Such incidents provided a welcome but rare relief in the routine of ploughing through weather which grew worse and worse as the year drew to a close. Yet there were compensations. The pilots and crews of Ansons flying over the desolate seas to the North and North-West of Scotland soon became well known to the lighthouse keepers on the many islands off these coasts. It was a strange but firm friendship. Neither could meet nor speak to the other save by signs. The crews dropped newspapers and magazines. The lighthouse keepers expressed their gratitude by waving their arms, and one of them was wont to display a large sheet with "Thank you" written on it. There was also a dog who was given bones from the air, and soon showed great skill in marking the spot where they would fall and snatching them before they could roll into the hungry sea.

An average of 85 ships were escorted daily throughout November, and the total number of convoys up to the end of the year was 598.

To the perils provided by the U-boat another was added at the end of October 1939. This was the magnetic mine. Fortunately, one of them was recovered intact from the sea off Shoeburyness. Its secrets were laid bare by the courage and skill of a naval officer, and experiments were at once made to determine whether this type of mine, which blew up when it came into contact with the magnetic field of a passing ship, could be exploded from the air by an aircraft capable of setting up a similar field.

The Wellington was soon found to be the aircraft most suited to the purpose, and a number were equipped with a hoop-shaped casing extending all round them and secured to their nose, wings and tail. The casing held a magnetic coil, and current to it was supplied by an auxiliary engine—the ordinary Ford V.8 type—carried in the Wellington.

Experiments were made at sea, and in the early days of January 1940 a number of Wellingtons of Coastal Command were minesweeping round our shores. It was hazardous and unpleasant work. It was difficult to take off and land the aircraft. When the mines

exploded the Wellingtons were severely jolted, and their crews had no warning to brace themselves, for they could not know the moment when they would pass over the mine. The fumes of the auxiliary engine caused violent nausea. This mine-sweeping from the air went on for some four months, after which it became no longer necessary, ships having been fitted with degaussing gear. From that moment the magnetic mine became a nuisance rather than a danger.

The flying of patrols over convoys was not the only method of protecting them. The Command carried out more distant patrols, the object being to discover U-boats before they had reached the area in which they would find the shipping they had been dispatched to attack. A continuous line patrol to within sixty miles of Norway was flown daily from the first day of the war, it being impossible to go farther because of the limited range of the Anson. The gap was covered by our submarines. On only two days in October was the weather so bad as to make the flying of such a patrol impossible.

The "Scharnhorst," accompanied by a cruiser and four destroyers, was discovered by a patrol of this kind on 8th October off the South-West coast of Norway, although on this occasion weather prevented an attack by bombers. Bomber Command made numerous attacks as the result of the special reconnaissances of Coastal Command. On 23rd November an American flying boat in service with the Command searched all night in severe icing conditions for the "Deutschland," which had on that day sunk the "Rawalpindi." The search for the "Deutschland" went on for some days.

From the outset the Command joined with the Royal Navy in attacking the U-boat wherever and whenever it was found. The first was seen on the third day of the war. It was bombed from so low a level that the column of water flung skywards by the explosion split the tail of the attacking aircraft, an Anson.

Two examples of the encounters in those early days may be given. On 8th December, 1939, at 9.30 in the morning, far to the North-West of Cape Wrath, an Anson saw a U-boat on the surface and dropped two bombs on it. The first fell a yard to starboard of the conningtower, the second into the swirl of air and water



Skulking in a dark corner of Josing Fjord, the prison-ship "Altmark" is discovered by Coastal Command reconnaissance.

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set up as the submarine dived. After a moment or two, during which the sea became covered with oil and bubbles, the U-boat came to the surface; her bows rose at an angle which grew steeper and steeper until her hull was almost vertical. Then she sank slowly, stern first. She was considered a total loss.

On 7th March a Hudson off the North-East coast of Scotland saw a U-boat near the surface. At the first attack only one bomb fell—fifty yards short. The Hudson went in again and this time succeeded in dropping two more bombs, one of which fell on the track of the U-boat, which had by then submerged. oil streak now appeared and grew gradually to the length of a mile. The time was close on 3.0 o'clock in the afternoon. At 5.0 p.m. two destroyers arrived and were directed to the spot by an Anson which had relieved the The destroyers dropped depth Hudson. charges. "A large, bubbling patch was seen."

By 31st December, 1939, out of seventy-five U-boats seen, fifty-one had been attacked, with considerable success. There was by then a marked decrease in U-boat activity. Coastal Command had had a share in achieving this satisfactory, if temporary, result. Up to the end of the year its aircraft had made 1,558 sorties and flown 40,633 hours and 20 minutes.

By the end of April 1940 the first bout of the Battle of the Atlantic was over. It had been to our advantage. Sterner days and a time of fiercer testing were, however, approaching.

Apart from their share in the opening stages of the battle, which directly and indirectly occupied so many of their flying hours, the aircraft of Coastal Command were engaged on other activities, of which two must be mentioned: the protection of our fishing fleets and the search for individual enemy or suspicious vessels. The Luftwaffe was brought early on the scene by the enemy and given an inglorious role to play. It began its attack upon us by bombing fishing vessels unprovided with any means of defence, and then machine-gunned the crews when they had taken to the boats. This practice was also extended to lightships. By the middle of October Coastal Command was giving protection to our fishing fleets in the area of the Dogger Bank and elsewhere in the North Sea and in the Irish Sea. This they did by extending their normal patrols and by flying special

sweeps carried out by aircraft in relays.

These patrols and the arming of the trawlers soon began to act as a deterrent, and the number of the fishing vessels sunk or hit fell off rapidly. Our aircraft were also of great use spotting nets and gear which had gone adrift. The crews of the trawlers and drifters gave quantities of fish to the local Coastal Command Stations and not infrequently set the Air Ministry a problem by addressing these to "Monty" (their term for an aircraft) X/796—or whatever the number was that they had seen painted on the fuselage when the aircraft passed over their heads—Air Ministry, London.

From the beginning, special searches were made for particular ships. Thus, early in November, 250 hours were spent in locating the "City of Flint," which the Germans sought to capture and which put in to a Norwegian port, discharged its cargo, and subsequently returned to the U.S.A. A search was made for the German ship "New York," and for a Greek vessel derelict in the Channel, where she was a menace to shipping.

The best known of these searches was that carried out to find the "Altmark." She was sighted at eight minutes to one in the afternoon of 16th February, 1940, by Hudsons of Coastal Command. They had been searching since dawn in misty weather which cleared by mid-morning, when the sun came out. It shone upon a sea which appeared to be frozen over for a considerable distance from the Norwegian coast. The "Altmark" was picked up about fifteen miles away. The Hudsons approached closely and the pilot of one of them, diving down, read her name in letters a foot high which, though obscured by paint, were clearly visible. Other aircraft took up the task of shadowing. The Royal Navy arrived at 2 p.m.

That afternoon the German vessel took refuge in Josing Fjord, whither she was pursued by H.M.S. "Cossack," who boarded her and removed the prisoners. Hudsons provided an escort for the homeward voyage of "Cossack" and the other warships engaged in this operation. On the way they spotted four floating mines, which were sunk by the destroyers. Hudsons stood by for a week in order to attack the "Altmark" should she venture out of Norwegian territorial waters; but she remained aground in the fjord.





THE BATTLES

OF THE

NARROW SEAS

Coastal Command's task is made heavier by the occupation of Norway, Holland and France, which gives Hitler many advanced bases both for an invasion of Britain and for his campaign against our Atlantic life-lines.

5: The Fight for Norway

ON 8TH APRIL, 1940, at 2.0 o'clock in the afternoon, a Sunderland flying boat sighted a battleship of the "Scharnhorst" class accompanied by two cruisers of the "Leipzig" class and two destroyers. They were a hundred and thirty miles from the Alsboen Light off the West coast of Norway. The ships saw the Sunderland almost at the same moment, and opened anti-aircraft fire which was both heavy and accurate. The Sunderland was hit almost at once; two of its tanks were holed and the hull gradually filled with petrol. When it landed at its base it had lost 300 gallons. That same day German destroyers had been seen at various times in the neighbourhood of the Horns Reef, steaming on a Northerly course. The German attack on Norway had begun.

Throughout the next day aircraft of Coastal Command were very busy reconnoitring the new area of battle. Before midday a London flying boat had reported the presence of a German cruiser of the "Köln" class in Bergen. This intelligence was confirmed later by a Blenheim and a Wellington. A Sunderland reported one "Hipper" class cruiser in Trondhjem Fjord, and Wellingtons enemy warships and possibly transports at Kristiansand (South). The cruiser at Bergen was attacked that afternoon by Wellingtons, which dropped thirty armour-piercing 500-lb. bombs from between 4,000 and 6,000 feet. They were met by heavy fire, but thought that they had scored one direct hit on her stern. On the next day a Hudson reported that after a further attack by naval Skuas from the aircraft carrier H.M.S. "Furious" the cruiser had sunk.

On 12th April a Wellington, put at the

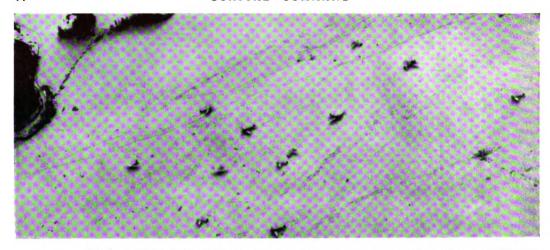
service of Coastal by Bomber Command, flew from an aerodrome in Northern Scotland over a thousand miles of sea to the North of When it entered Narvik Fjord Norway. "huge rocks towered up on either side of us," reports the wireless operator. "Snow drifted down so that we could see only a few yards ahead. The gusts were terrific, bouncing and throwing us about. . . . By then we reckoned we were within about ten miles of Narvik. but we could not continue. Visibility was almost nil. . . . We went about and picked our way down the fjord again . . . like a boat hugging the shore. Suddenly we saw once more the open sea." They soon saw something else, a Ju.88 crossing their bows. "We began to circle each other, two heavy bombers waiting to pounce." Then the inevitable curtain of snow fell and they lost each other. Near Narvik the compass showed errors of between twenty and thirty degrees, but the Wellington set course for base and landed safely after a flight of fourteen and a half hours.

On the next day the Royal Navy entered the fjord and sank seven German destroyers. A second reconnaissance, made on 22nd April, also by a Wellington, covered 1,180 miles in eight and a half hours and photographed Trondhjem. It saw, among much else of interest, twenty-two German aircraft on "a frozen lake," and its signal about this discovery was picked up by an aircraft carrier whose aircraft "bombed the lake with excellent effect."

By 14th April the German Air Force was in occupation of all the aerodromes in Norway and Denmark. The most suitable from which to launch air attacks on the Fleet in Scapa Flow or on other Scottish naval bases was that at Stavanger, where there was also a seaplane anchorage. It is not quite three hundred miles from the nearest point on our coast. The Germans began without delay to make the fullest use of it and for us it became an important target. Coastal Command bombed and machine-gunned it many times, beginning on 10th April. Here is the report contained in the official summary of a machine-gun attack by a long-range Blenheim. It is typical of many such.

"Reached Norwegian coast at 16.00 hours on 10th (April). At 16.04 entered the clouds

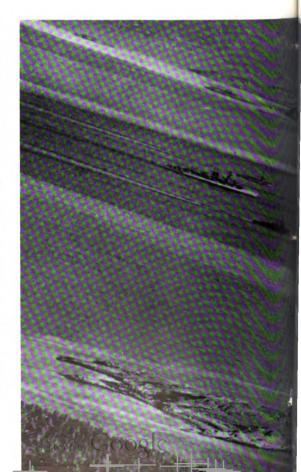




The frozen lake at Jonsvatnet, used by the Germans as a makeshift airfield. A Wellington spotted 22 enemy aircraft on it. As a result, the lake was bombed—" with excellent effect."

after seeing five Messerschmitts taking off from Stavanger. At 16.10 observed 18 seaplanes (Bloem and Voss) in the harbour, also 20 Heinkels and 15 Messerschmitts on the aerodrome. Two Heinkels and three Bloem and Voss seaplanes were raked with machinegun fire from a height of a hundred feet. One Heinkel was destroyed by an explosion and the other damaged. A Bowser pump was set on fire whilst filling a large bomber. 2,000 rounds in all were fired. At 16.20 the Blenheim aircraft set course for Bergen, but failed to locate it. At 18.15 (on the way home) a Ju.88 was attacked in a position 135 miles from (North coast of Scotland); 500 rounds were fired, which put the port engine and rear gunner out of action, and it is doubtful whether the enemy aircraft could have reached its base. Heavy anti-aircraft fire was encountered at Stavanger and our aircraft was hit by Undercarriage partially explosive bullets. collapsed on landing, rendering aircraft unserviceable. The pilot was slightly injured in the hand from splintered glass caused by enemy fire."

At dawn on 17th April the aerodrome was shelled by H.M.S. 'Suffolk"; a Hudson spotted for her and had to fight a Ju.88 over the target. Despite many attacks it was



impossible with the forces at our disposal to do more than make the aerodrome uncomfortable and dangerous to use. It could not be knocked out, and this was equally true of the other important aerodrome at Vaernes.

Though seizing every opportunity to attack, Coastal Command continued throughout April and May to play its main role, that of reconnaissance. Patrols were flown whenever possible up and down the coasts of Norway. Hudsons from Scotland had a particularly gruelling time. Their efforts were reinforced by those of long-range Blenheims which had begun to join the Command in small numbers. They were at that time the only aircraft which could be used as fighters over Norway with the exception of the naval Skuas which operated from aircraft carriers of the Royal Navy.

The Blenheims shared with the Hudsons the task of attacking an enemy air force greatly superior in numbers and possessed of bases in the area of combat. To reach this our own aircraft had to fly between 300 and 400 miles, and when the patrol was over they had to return over the same distance. This meant that the Blenheims had at most an hour at their disposal during which they could provide air cover to our naval units and, as the campaign developed, to our troops engaged in battle in the regions of Namsos and Aandalsnes. As was to be expected, they and the Hudsons met heavy opposition and combats were frequent.

The closing days of the month saw the withdrawal of the British forces from Namsos and Aandalsnes. These evacuations were

Norway—the new battle area. Low-flying reconnaissance caught this "Nürnberg" class cruiser steaming with four mine-sweepers off Narvik.



carried out by the Royal Navy covered by naval aircraft and by Coastal Command. This entailed an increase in escort duties which put a considerable strain on its resources, for it must be borne in mind that the Norwegian campaign was not allowed to interfere with the normal routine of Coastal Command.

Though we had had to withdraw at Aandalsnes and Namsos, Allied troops still remained in the neighbourhood of Narvik, which was besieged and finally captured on 8th June. For the success of this operation it was necessary to construct aerodromes and set up a wireless station in the region of Bodo. A number of technical experts were needed and were brought there by two flying boats, the "Cabot" and the "Caribou, which had been taken off the Atlantic service of British Overseas Airways and lent for this There is little doubt that their purpose. presence very soon became known to the German Intelligence Service, who may have

The "Scharnhorst," sighted in Trondhjem Fjord on June 10th, 1940, became the target of a series of attacks by Coastal Command and the Fleet Air Arm. The damage inflicted during these hard-fought engagements kept her out of action for eight months



obtained the information from local quislings. The flying boats were both destroyed before they could be refuelled for the return journey.

Not all the efforts of the Royal Air Force or of the aircraft of the Royal Navy could prevent the enemy from winning the mastery of the Norwegian air. It was, indeed, physically impossible to prevent him. The numbers of aircraft at the disposal of both Services were too small: the distance they had to fly too great. This was not altogether true of the naval aircraft, for the carriers from which most of them operated went in dangerously close so as to enable the Skuas to remain as long as possible over the areas in which fighting was taking place. But there were not nearly enough of them, and they were much slower than the Messerschmitt 109 and 110 at the lavish disposal of the enemy. Nevertheless their efforts and those of Coastal Command to strike the enemy did not cease with the withdrawal of the British and French troops.

On 10th June, two days after the evacuation of Narvik, a Blenheim, one of three on reconnaissance over Trondhjem Fjord, sighted the "Scharnhorst" and two cruisers, one of which they thought might not be a cruiser but a pocket-battleship of the "Deutschland" class. The warships were back from their successful encounter with the "Glorious" two days before. It was decided to assault them where they lay at anchor near a supply ship, and twelve Hudsons carried out a pattern bombing attack from 15,000 feet. They dropped 36 250-lb. armour-piercing bombs, losing one of their number to anti-aircraft fire and another to an enemy fighter. The "Scharnhorst" was probably missed, but both the cruisers and the supply ship received direct hits. This was on 11th June.

On the night of the 13th/14th naval aircraft took a hand. The "Ark Royal," escorted by the "Nelson" and other units of the Home Fleet, arrived at a position 170 miles off Trondhjem. At midnight fifteen Skuas took off for the attack. Long-range Coastal Command Blenheims provided fighter cover over the objective, while Beauforts of the same Command created a diversion by attacking the nearby aerodrome at Vaernes in order to prevent, if they could, German fighters from taking off to engage the Skuas. At that time



Bergen harbour, crowded with German transports and supply ships, one of which is burning at the quayside after an attack by the R.A.F.

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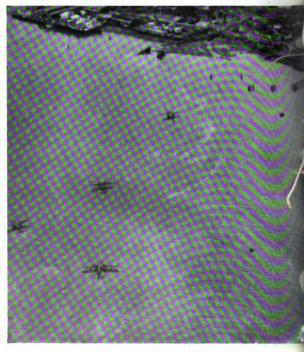
of the year, and in that latitude, daylight is perpetual. It was not possible, therefore, to effect surprise. The enemy were prepared and waiting. The Skuas pressed their attack with the greatest determination. Eight of them—more than half—were shot down, but two hits were scored on the "Scharnhorst."

Two days later a reconnaissance showed that she was still at Trondhjem. On 16th and 17th June two attempts by Coastal Command were made to attack her, but clouds, lower than the hill-tops, obscured the harbour. It was not until 21st June that the "Scharnhorst" was again sighted. This time she was at seaeight miles West of the Utyoer lighthouse -steaming South at 25 knots, with an escort of destroyers. After an unsuccessful attempt by three Blenheims to find her, she was picked up at 2.45 in the afternoon by a Sunderland. The flying boat was at once attacked by heavy fire which endured for an hour. During this time its crew watched a torpedo attack by six naval Swordfish, of which one was shot down. Shortly afterwards they found themselves engaged with four Me.109s. captain was that same officer who had piloted the Sunderland which had fought six Ju.88s when protecting a convoy on 3rd April. The combat lasted about half an hour. All the Messerschmitts were hit and one fell in flames to the sea.

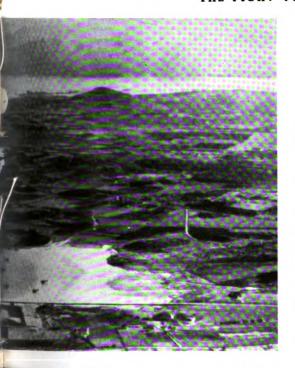
The Sunderland, which was slightly damaged, made off for its base shortly before the arrival soon after 4.30 p.m. of nine Coastal Command They belonged to a squadron which had been grounded because of trouble with their engines. On hearing that the "Scharnhorst" was at sea every pilot volunteered to take up his aircraft. They were allowed to make the attack. When they saw these Beauforts, it is probable that the Germans thought that, like the Swordfish, they were carrying torpedoes and that another torpedo attack was imminent. The destroyer escort was seen to deploy so as to intercept, if they could, the torpedoes launched against the capital ship.

The Beauforts, however, were loaded with armour-piercing bombs and, flying in a crescent formation, made a dive-bombing attack. At least three bombs hit the "Scharnhorst," one on its stern, another nearly amidships







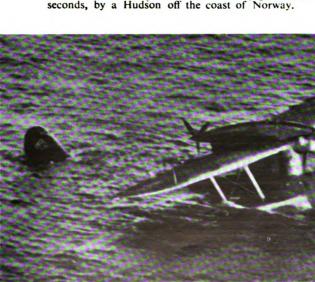


and the third forward on the port side. The Beauforts were forthwith attacked by Me.109s in number from 45 to 50. Three were shot down; the rest got back to their base. There were no cases of engine failure. Hudsons, one of which was lost, renewed the attack, but encountered fierce opposition from an enemy now fully ready to meet them, for the warships were by then only 25 miles from Stavanger. In this action five aircraft were lost altogether, but the "Scharnhorst" had received sufficient damage to cause her to retire to a floating dock at Kiel. She remained out of action for the rest of the year and did not put to sea again until early in 1941.

The part played by Coastal Command in operations against her during 1941 will be set forth later. It is now time to go back to the early days of May and to move from the wild and solemn beauty of Norway, from gleaming fjords and sombre mountains where flying is at once a delight and a peril, southwards to placid, open lands.

On 10th May Germany invaded Holland, Belgium and Northern France.

German aircraft bases. Above, Stavanger, only 300 miles from the coast of Britain, menaced our own naval bases and was frequently attacked by Coastal Command. Left, the seaplane base at Trondhjem. Below, a Dornier flying boat, brought down, after an engagement of 35 seconds, by a Hudson off the coast of Norway.





6: Heinkel-haunted Skies

THE ATTACK IN THE WEST

THE GERMAN ATTACK on Norway added to the labours of Coastal Command in more ways than one. The number of reconnaissances over the Frisian Islands and the Heligoland Bight had also to be increased. Thus on 12th April a Hudson made a reconnaissance of Texel, Borkum and the other neighbouring islands, and thereafter more and more of these patrols were flown as this faster type of aircraft with its longer range took the place of the slower and shorter ranged Ansons.

In order to fulfil their task the Hudsons had soon to engage in combat; for the enemy was vigilant and active. An account of one of these duels must suffice. On 3rd May a Hudson was attacked near Borkum by three Me.109s. One of them was shot down by the rear gunner, who was killed almost immediately afterwards. His body jammed the turret, and the Hudson. defenceless from the rear, made off hotly pursued by the remaining Messerschmitts, who fired repeated bursts at it until their ammunition gave out. By this time the Hudson, which had gone down to within a few feet of the water, was riddled—242 bullet and 12 cannon-shell holes were counted when it landed-its pilot and navigator were wounded but the engines were untouched. The Messerschmitts flew for some time in formation with it and rocked their wings in appreciation of the valour of its crew. Once free of the enemy the pilot showed signs of collapse. The automatic control was switched on and while the pilot was recovering the navigator and the wireless operator withdrew from the turret the dead air gunner and laid him on the floor of the aircraft. So they brought him home.

It was becoming increasingly obvious in



Crash-landings on Kattewijk beach, observed by our reconnaissance on 10th May, 1940, were one of the first signs that the invasion of Holland had begun.

the first days of May that something was in the wind. On the 7th of that month all telephone and telegraphic communications between Holland and the U.S.A. were suspended. A considerable amount of German shipping, including a cruiser, had been observed by Hudson patrols off the Frisian Islands. On the same day Beauforts on reconnaissance attacked the cruiser. Enemy destroyers were also observed plying busily along the North-West coasts of Germany.

The 10th May did not therefore find the Command unprepared. Blenheims on reconnaissance early that morning reported eleven German aircraft crashed on the beach just South of the spot where the Amsterdam Canal joins the sea, and eleven Ju.88s on the aerodrome at The Hague, which was strewn with the abandoned parachutes of German paratroops.

The 12th May was full of incident. Three Blenheims fought eight Me.109s while giving cover to British destroyers engaged in landing marines at the Hook. Two of the Blenheims were lost, but the third accounted for two of the enemy. A little later three more Blenheims attacked about twenty-four Ju.88s and Heinkel 111s seeking to bomb an ammunition ship in Flushing Harbour. The battle, fought at heights

which varied from 5,000 to 500 feet, lasted forty minutes. The ammunition ship remained unscathed. Finally, a Swordfish and four Beauforts bombed Waalhaven aerodrome and a fifth the football ground next door, the attack being repeated by Hudsons after nightfall.

By that time "a great pall of smoke was drifting across blazing Rotterdam, and more fires had started at Dordrecht and the Hook." The water in the canals of The Hague gleamed livid in the light of burning oil tanks and in the brighter glare of the warehouses and buildings behind the neat, well-ordered quays. So the flame of war swept over the Netherlands. The pilots of Coastal Command watched its fiery progress from Heinkel-haunted skies. They were flying and fighting over a scene of destruction and chaos. Harbours were filling with sunken ships, aerodromes and beaches with wrecked aircraft, roads with herded refugees. The enemy was everywhere. By the evening of 13th May the Dutch Air Force, which had fought with gallant fury since dawn on the 10th, was literally no more. Of its total strength of 248 aircraft there was left not one. On 15th May, at 11.0 a.m., Holland, overwhelmed, capitulated.

For Coastal Command the centre of interest was now shifted Southward. For five days it had fought over Holland and escorted ships moving to and from that country with troops and refugees.

The part played by Coastal Command in the Battle of France was shared by naval Swordfish, Albacores, Skuas and Rocs disembarked from carriers. The targets were enemy motorised columns engaged in the great drive which formed so important a role of those columns. On 24th May the slow-flying Swordfish twice attacked an enemy tank column on the road between Calais and Gravelines. They lost one of their number to heavy anti-aircraft fire from a nearby wood, but they destroyed three tanks and made five direct hits on the road.

Ansons of the Command were also very busy. They were on constant watch for enemy E-boats which, now that the Dutch ports were in the hands of the enemy, were seeking to

The armada of little ships that evacuated our army from Dunkirk. The Hudson flying above them was one of the Coastal Command aircraft which made 327 sorties over this area in four days.



run down into the Narrow Seas and prey upon our shipping. On 20th May they were in action against E-boats off Texel, and there was much activity during the next few days. On the 25th, for example, four miles off the Maas, an Anson blew an E-boat to pieces with an anti-submarine bomb, and two more were raked with machinegun fire. Altogether in the thirty-three days between 20th May, when the first E-boat was attacked, and 21st June, when France and Germany signed an Armistice, 17 attacks on E-boats were made by aircraft of the Command.

Meanwhile, at night Hudsons and Beauforts delivered a series of attacks on the oil tanks and plant at Rotterdam. On 20th May several tanks were hit and fired, the smoke of their burning rising to 7,000 feet, and by 31st May the Group to which these aircraft belonged was able to report: "It appears that all oil tanks are now destroyed." Another attack on oil targets may here be mentioned, though it took place somewhat later. On the 9th June, seven Beauforts bombed the oil tanks at Ghent, causing huge fires. They came down to four hundred feet and added to the destruction by machinegunning those tanks not hit by bombs. "I saw Germans round the oil containers," said one of the navigators, "running about like confused hens. They were the first enemy I had seen. We used armour-piercing bullets followed by incendiary, and the tanks flared up like torches.'

The activity of the Command can be judged by the number of patrols flown in daylight. Ninety-four of varying strength were carried out over Holland, Belgium and Northern France in the first twenty days of the battle. This number was to be exceeded not in the next twenty, but in the next seven days. From 30th May to 4th June 135 patrols were flown. On 30th May the evacuation of the British Army and the French Northern Army from Dunkirk was begun.

In this operation it was the part of Coastal Command to cover the area of the Narrow Seas while Fighter Command provided closer protection. Coastal Command gave to its orders the widest interpretation. Not only were German bombers and their escorts attacked, but also, where possible, German troops. It is not necessarily in the actual area where an operation by land and naval forces is in progress that the most effective air support can be given;

much can be done by attacking the oncoming armies of the enemy.

Thus, on 31st May, ten Albacores and nine Skuas, under the direction of Coastal Command, bombed pontoon bridges over the Nieuport Canal and piers on the foreshore. Direct hits were made. Going home, the Skuas, their ammunition exhausted, ran into twelve Me. Two Skuas were lost, but the remainder got away, for the Messerschmitts turned upon three Hudsons on patrol. The Hudsons closed up into tight formation and went down low over the sea. There they fought out the battle, driving off their far swifter opponents and shooting down one of them with no loss to themselves. On the next day the same three Hudsons attacked about forty enemy aircraft near Dunkirk. They shot down, again without loss, two Ju.88s and one Ju.87 for certain and severely damaged four more.

One of three Ansons, after an action off Zeebrugge, landed in the sea short of petrol forty yards from a destroyer. The crew, confidently awaiting rescue, observed with some dismay a hundred or more naval ratings suddenly cast themselves from the destroyer's deck into the water. "We are sinking," shouted the pilot. "So are we," was the answer. The crews of both craft were rescued by another destroyer brought to the scene by another Anson.

On the last day of May and the first three days of June, when the evacuation operations were at their height, one Group of the Command made 327 sorties over or near Dunkirk. It must be remembered that this severe fighting was being conducted by General Reconnaissance pilots and crews with no specialised fighter training, flying aircraft neither designed for the purpose nor possessed of the great speed of their adversaries. It was found, however, that the British types, especially the Ansons. showed great powers of manœuvre. pilots, by keeping in a tight turn in the direction of their faster flying enemy, were able not only to avoid his fire but also to bring their own to bear with good effect.

Aircraft of Coastal Command were able to help in the rescue of men in small boats or struggling in the sea. On 1st June escort vessels were guided to soldiers seen clinging to wreckage, and later on that day tugs were



brought to two heavily-laden lifeboats, while enemy aircraft which appeared on the scene were driven off. On 5th June a motor-boat and dinghy with French troops on board were sighted and a French destroyer informed. It picked them up. A high-speed launch, five seaplane tenders and a pinnace, all belonging to the fleet of water-borne craft at the disposal of Coastal Command for the Air-Sea Rescue Service and for other purposes, also played a part. Their exploits are best described in the words of the official report:

"The seaplane tenders proceeded to Dunkirk under the command of a Pilot Officer at dawn on the 31st May, and were thereafter engaged on the very difficult task of ferrying soldiers from the beach to larger vessels lying off. Some 500 men were taken off; two tenders were lost in the process, but their crews were saved.... During this operation the crew of

Seaplane Tender No. 276 showed great bravery and resource. After being bombed and machine-gunned and having the starboard engine throttle control carried away by a shot, they carried on to Dunkirk, completed their task, and returned to Dover on one engine. During their voyage a gun-mounting was improvised out of a towing-bollard, an engine starting-handle, a tube and some rope. From this lash-up they were able to maintain a high rate of fire with their Lewis gun."

When the evacuation of Dunkirk was ended the activities of the Command over Holland, Belgium and France became fewer. This, in the circumstances, is not hard to understand. The strain on its resources had been very great, and some relaxation, now that so much of the British Force in France had been successfully withdrawn, was necessary. Operations were still directed against German E-boats with such

"They were flying and fighting over a scene of destruction and chaos."





effect that after a time they tended to fight shy of waters patrolled by aircraft of the Command.

By the end of the first week of June British naval vessels, troopships and merchant vessels were moving away towards England. On the 18th air patrols "saw troop transports, armed trawlers, hospital ships, drifters, barges with floating cranes, lightships, sailing vessels with a few troops on board, all making for Southampton. The procession continued all day." The last escort patrol took place on 20th June, when protection was given to cross-Channel steamers carrying civilians away from Jersey and Guernsey. Throughout these days no German aircraft attacked any of this shipping.

So ended the immediate part played by Coastal Command in the battle of the Netherlands, Belgium and France.

As it progressed it became more and more obvious that an attempt to invade Great Britain would be made as soon as the Germans had completed their subjugation of Western Europe. As early as 6th June, 1940, therefore, measures were taken by Coastal Command to keep a close watch on all ports from which a fleet of invasion might be expected to sail.

Air reconnaissance became vital after Hitler occupied the Channel ports. Left, an electrically-operated camera on a British flying boat; right, invasion barges massed in Boulogne harbour.

Air reconnaissance became of even greater value than before. It was indeed indispensable. A series of anti-invasion patrols were instituted and these were flown daily up and down the coast-line of the occupied countries.

On 13th June there was added to these patrols another series flown with the design to photograph everything in the ports and thus to discover hostile movements from which the probable intentions of the German High Command could be deduced. The aircraft which carried them out often flew as low as 500 feet in order to obtain clear and well-defined pictures. Both kinds of patrol very soon became offensive.

As the days went by Coastal Command bombed the enemy more and more frequently. making raids on Den Helder, Ijmuiden, Willemsoord, Rotterdam, Calais, Boulogne, Cherbourg, Le Havre, Lorient, and other places in Holland, Belgium and France. The objectives were for the most part barges and The places most often visited were Boulogne, which was bombed 21 times up to the end of October, and Cherbourg, which was bombed 24 times. The Command was especially active in September, its aircraft being over these and other enemy bases on all but three days of that month. These attacks were all made to hinder the preparations for invasion. Bomber Command was at that time engaged on a similar task, but much of its strength was being used on targets farther afield, such as Hamburg, Bremen and other German ports, and also on the centres of Germany's war industries.

Nor were aerodromes in enemy occupation neglected. Coastal Command attacked them 41 times during the same period, the places bombed ranging from Aalborg in Denmark to Cherbourg in France.

Altogether from the opening of the German offensive Coastal Command delivered 251 attacks on land targets and barges in or near harbour. Their scale was not, however, formidable. It could not be, for the Command





did not have the necessary strength in aircraft. But what was lacking in numbers was made up in skill and determination. It soon became the practice to allow our pilots, when they had completed a routine patrol, to attack selected targets if circumstances permitted. On 28th June, for example, the gas-works at Willemsoord were blown up by a single aircraft on its way back from a reconnaissance. This permission our pilots regarded as a privilege, and they availed themselves of it as often as they could.

From the end of the first week in August to the 31st October, 1940, Fighter Command was engaged with all its strength in the Battle of Britain. Those weeks were critical. Had that battle been lost, aircraft of Coastal Command patrolling off Norwegian fjords, off Danish and Dutch sandbanks and islands, off the grey shores of Belgium and the iron coast of Northern France might well have had to report that the German Armada was standing out to sea.

7: Seeking the Raider in his Lair

ON 9TH APRIL, 1940, the problems of Coastal Command became of larger consequence by reason of the German invasion of Norway. From that date the enemy began with increasing speed to possess himself of bases not, indeed, invulnerable, but well protected by nature from assault by sea and air, and so situated that his conduct of the Battle of the Atlantic became a simpler task. His U-boats and surface raiders could now move out from their harbours in the North Sea or the Baltic up the long Norwegian coast close inshore, through waters among the most sheltered in the world,

into the Atlantic, where an area of battle vast in extent, and therefore very difficult to patrol, awaited them. To their number was soon to be added a third menace, the four-engined Focke-Wulf Kurier.

In a short month the enemy brought his advanced air and sea bases to within 350 miles of Britain. But worse was soon to follow. By the end of May he had acquired all the bases of Holland and Belgium. On 17th June France sued for an Armistice and on the 21st its terms were signed. Under them Germany obtained, among much else, the right to occupy the whole coast-line of France with all its harbours, roadsteads, estuaries and ports from Dunkirk in the North to Bordeaux in the South. Thus, before June 1940 was out, the Germans had the whole coast-line of Western Europe under their control, with the exception of that of Spain and Portugal. The second and grimmer phase of the Battle of the Atlantic was about to begin. It seemed that the advantage lay all with the enemy.

Reduced to its simplest form the problem of countering the activities of surface raiders, U-boats and long-range bombers consists in destroying them either in their bases or when they are out looking for shipping to attack. After the fall of France, Coastal Command increased its reconnaissance activities, and patrols were established and maintained from the North of Norway to the Spanish border. They were, and are, an addition to the normal convoy patrols, which altered in character after the German occupation of so much of Europe's coast-line had very greatly increased the danger of air attack upon convoys sailing through the Channel.

This work of reconnaissance is not carried out without opposition. There have been many encounters with the Luftwaffe, who are able to use short-range fighters for the defence of their country's ill-gotten gains, whereas we must send out Hudsons, Blenheims, Beauforts and flying boats because of the distance separating this island from the areas to be reconnoitred. This disadvantage, while it adds to the difficulties and dangers of the task, has not prevented its fulfilment. It is performed in all weathers, though in daylight cloud cover is almost essential. "By skilful use of a diffused layer of cloud, which was at

7,000 feet, he succeeded in entering the port of Brest, obtaining his photographs and dropping his bombs. . . ." "In brilliant sun the three aircraft set out on their patrol to Cherbourg. Just outside they encountered six of the enemy. The three Blenheims turned into the sun, forming line astern, but one failed to close into formation successfully. This machine was engaged by the enemy and when last seen was diving steeply towards the sea with smoke pouring from both engines. . . ." There are many such reports. They illustrate clearly enough the importance of cloud cover.

Flying boats have also been used and have made some remarkable flights. On 21st January, 1941, a Sunderland flew up the Norwegian coast from Trondhjem to Narvik. Twenty miles from that town German soldiers were seen on parade. They received a general purpose bomb and the rest of the load was dropped on a barracks, a motor convoy and a large ship in the harbour of Narvik. Immediately afterwards the Sunderland was hit by

two bursts of A.A. fire, the first putting both front and rear turrets out of action, the second damaging the tail-plane. On the way home, as the flying boat was nearing Scotland, the clouds closed right down. A landing was made on the sea near an island and the boat had to be taxied up and down in the lee of a cliff for the whole night, thirty-one vain attempts being made to get the anchor to hold. The Sunderland was towed at dawn to a nearby cove and beached. Its subsequent adventures included a duel with a Me.110, which it beat off, though armed only with a borrowed tommygun, when on passage to the South of England for final repairs.

These examples by no means represent the whole duty of Coastal Command. Obviously, if a submarine or surface raider can be dealt with in harbour, it will not be able to play an active part in the Battle of the Atlantic. To attack them there is work for the Royal Navy and for Bomber Command, but Coastal Command has had a hand in the business

Dieppe, showing block-ships sunk by the British at the harbour mouth, at the entrance to the Inner Channel, and in the Bassin de Paris.



Cherbourg. A low-level feconnaissance photograph showing great damage to warehouses and quayside installations.





St. Nazaire, a U-boat nest frequently raided by Coastal Command during 1940-1941. 1. The dock-gate later destroyed by H.M.S. "Campbeltown" in the Combined Operations raid. 2. "M" Class Minesweepers in the Outer Harbour. 3. U-boat Pens under construction. 4. Shipyards. 5. French aircraft carrier "Joffre," dismantling in dry-dock.

from the beginning. No time was lost in opening the attack, although, as with the invasion ports, the assault was not on a heavy scale. Coastal Command is not exclusively equipped for bombing. Nevertheless it made 682 attacks on land targets between 21st June, 1940, the date of the Armistice between France and Germany, and the end of December 1941.

Excluding aerodromes, which the Command attacked 130 times in France, 30 times in the Low Countries, 44 times in Norway and thrice in Germany, there were during that period 28 attacks on French fuel dumps and electrical power plants, 36 attacks on Dutch oil installations and eight on Norwegian. There were also 69 attacks on other miscellaneous targets. The bulk of the effort, however, was naturally directed against docks and harbours and the shipping in them. Brest heads the list with 62 attacks; Boulogne follows with 50. Then comes Lorient with 30, Cherbourg with 28, St. Nazaire with 21, Le Havre with 16, Calais with 13 and Nantes with five. Many other places containing such targets have also been attacked less frequently.

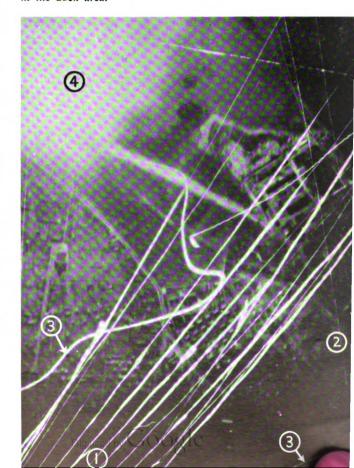
The raids have been made mostly at night. To describe them in detail is impossible within the compass of a short account. They were, and are, harassing operations designed to destroy valuable stores and necessities for the prosecution of the battle and to interfere as much as possible with the lives of men on garrison duty in foreign and hostile lands. As such they have been very successful, and if their scale is now diminished, it is because that work can now be performed by Bomber Command, of which the strength is steadily increasing. More and more of the offensive power of Coastal Command is now being directed against shipping, as will be explained in due course. At the beginning, that is to say after the fall of France, the effort made by Coastal Command was not inconsiderable having regard to the numbers of aircraft available. One squadron alone, for example, made 28 attacks on French ports, involving 136 individual sorties, in six weeks.

In the early days Ansons, too, played a part before they were relegated to training Groups. In the fortnight following 23rd September, 1940, an Anson Squadron carried out a series of attacks on Brest, dropping their bombs from heights as low as 2,000 feet and then diving to 500 feet to shoot out searchlights. They were often accompanied by Albacores of the Royal Navy awaiting the completion of the aircraft carrier which was to be their home. Lorient, too, came to be important, for it was soon made one of the main bases for German submarines. The primary target was at first the power station and later on the submarine moorings. Blenheims attacked both on 8th, 13th and 17th October, and again on 7th and 8th November, being accompanied on these last two raids by Beauforts and Swordfish. The attack on the 13th was very successful and large fires were caused. December German submarines were discovered farther South in the Gironde, near Bordeaux. They were attacked by Beauforts carrying land-mines on 8th and 13th December. Large explosions and fires followed.

The pilots who carried out such attacks are only slightly less laconic than the official reports. "The bombs caused an enormous explosion," said one of them who flew a Beaufort in an attack on Brest on 13th January. 1941, "which shook the aircraft so violently that the crew thought they had received a direct hit from anti-aircraft fire. Showers of sparks accompanied the explosion, which sent up a column of smoke to the height at which the aircraft was flying-10,000 feet." During a raid on St. Nazaire a Blenheim looped the loop when an anti-aircraft shell exploded immediately beneath its fuselage. "The concussion stunned the second pilot, knocked out the rear gunner and left the pilot dazed." When they recovered consciousness the Blenheim was in a dive from which the pilot was unable to pull out until 500 feet from the ground. On regaining a level keel it was found that all the instruments were out of order and that everything loose on the navigator's table, including his charts, had disappeared, flung out of a hatch which had been forced open. The pilot succeeded in climbing up to 8,000 feet. "The Blenheim was see-sawing up and down like a switchback and we thought we should have to bale out." He was able, however, to keep control until a patrolling Beaufighter was sighted off the English coast in the dawn. The Beaufighter escorted the Blenheim to an aerodrome where it made a safe landing.

Sometimes attacks were made by day. On one occasion a Beaufort was off La Pallice at 9,000 feet. "Alongside the wharf," says the observer, "we could see a ship of about 7,000 tons discharging cargo. The crew were busy on the deck and workmen were coming and going about the wharf. The pilot pointed to the ship and said: 'Shall we bomb it?' I nodded, thinking he meant to do a little high-level bombing. The next thing I knew was that I was flat on my back. The pilot had put the nose right down in the steepest dive I have ever been in. We dropped from 9,000 to 100 feet. At the bottom we let go the bombs and then began to pull out, dodging between the cranes on the wharf. For a moment

Night raid on St. Nazaire. 1. Light flak. 2. Tracer bullets. 3. Searchlight beams—they appear as wavy lines because the aircraft that took the photograph was jinking to avoid the flak. 4. A big fire in the dock area.



we were actually flying under the German flag, for as we beat it over the dock I saw out of the corner of my eye a swastika flag hanging from a staff about fifty feet above us. The ship's stern was wreathed in smoke as we left."

Inevitably as time went on attacks became concentrated on Brest, especially after the last week in March 1941, when the "Scharnhorst" and the "Gneisenau," or "Salmon and Gluckstein," as they are known throughout the Royal Air Force, took refuge in that naval base on their return from commerceraiding in the Atlantic. Coastal Command attacked them, either alone or as part of an operation by Bomber Command, 63 times in 1941, including an attack on the "Scharnhorst" on the 23rd July when she had sought temporary refuge at La Pallice. The defences of Brest, always formidable, grew stronger and stronger.

On one occasion a Blenheim was forced by the failure of both engines to glide through them. It circled slowly round above the harbour while the pilot still tried to get into a good position from which to drop his bombs. "It looked as though we should come down in enemy territory," he said, "so I thought we might as well drop our bombs in the best place possible." The first attempt did not succeed, and before releasing its load the Blenheim glided three times round the docks, each time going lower and lower. At last a good target came into the bomb-sight and the bombs were dropped at the very moment when both the engines picked up simultaneously. The Blenheim reached base unscathed.

One attack must be specially mentioned. It was made by a torpedo-carrying Beaufort of Coastal Command at first light on 6th April, 1941. Six Beauforts were given the task of torpedoing one of the battle-cruisers known to be lying alongside the quay in the Rade Abri at Brest. The aerodrome in the South-West of England from which they started was rainsoaked and three of them became bogged when trying to take off. These took no part in the operation. The fourth failed to find Brest in the haze which preceded the dawn and returned with its torpedo. The fifth went in to attack a few minutes too late. "When I

arrived at Brest," reported its pilot, "it was full daylight. I crossed the spit of land at the South-West corner of the harbour, coming under fire from shore batteries. I then came down to a few feet above the water and flew towards the mole protecting the Rade Abri. behind which the battle-cruiser lay. I passed three flak-ships . . . and nearly reached the mole itself. By then I was being fired at from batteries all round the harbour. . . . Continuous streams of fire seemed to be coming from every direction. It was by far the worst flak I have ever encountered. When I was nearly up to the mole I saw that the battle-cruiser herself was completely hidden from me by a bank of haze. I therefore turned away to the East and climbed into cloud." The sixth and last Beaufort had attacked a few minutes before. It crossed the same spit of land South-West of the harbour entrance at a low height and found an enemy battle-cruiser, almost certainly the "Gneisenau," lying alongside the quay on the North shore, where it was protected by a stone mole curving round from the West. The Beaufort came in very low and was at once under the fire of some 270 anti-aircraft guns of varying calibres established on the rising ground behind the ship and on the two arms of land which encircled the outer harbour. To the formidable concentration of fire which these guns immediately produced was added the barrage from the guns of the warship itself and from those of the three flak-ships already mentioned. Moreover, having penetrated these formidable defences, the Beaufort, after delivering its low-level attack, would have had the greatest difficulty in avoiding the rising ground behind the harbour. All these obstacles were known to the pilot, who, "despising the heavy odds, went cheerfully and resolutely to the task." He passed the anti-aircraft ships at less than mast height, flying into the very mouths of their guns. Skimming over the mole, a torpedo was launched point-blank at a range of some 500 yards. The battle-cruiser was hit and damaged below the water-line. Subsequent photographs showed that she was undergoing repairs.

The Beaufort did not return. There is a story that it fell on the deck of its quarry. It was manned by a graduate of Cambridge University, a Canadian from Toronto, a farmer





Brest. A Coastal Command aircraft, diving out of low cloud, flew at 500 feet over the most heavily defended harbour on the Continent to take this photograph of a "Hipper" class crusse in dock.

from Somerset and a chauffeur from North London. They are of that company—

"Who wore on their hearts the fire's centre;
Born of the sun they travelled a short while
towards the sun,

And left the vivid air signed with their honour."

Their ranks were joined on 12th February, 1942, by the crews of those naval Swordfish which on that day attacked the same ship and her consorts in the English Channel. The pilot of the Beaufort and the leader of the Swordfish were each posthumously awarded the Victoria Cross.

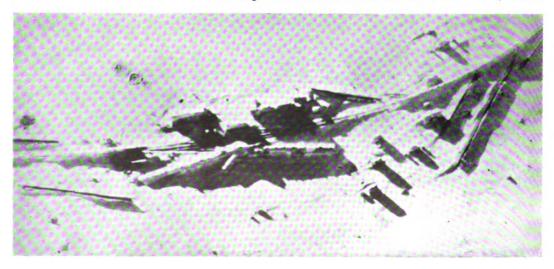
One of the objects of Coastal Command in attacking fringe targets is to prevent, if it can, German sailors and airmen who are taking an active part in the Battle of the Atlantic from obtaining the rest they need. Another is to harass the German troops in occupied countries.

Finse in Norway is a well-known winter sports centre. It consists of a small railway station with an hotel near by, and a few mountain huts and chalets. The railway passing through it is protected from avalanches by a number of snow-sheds, which are wooden tunnels some hundreds of yards in length. It was

known that the hotel contained a large number of German officers and Norwegian quislings enjoying a ski-ing holiday. There were thus two objectives: to destroy or damage the sheds, which would interrupt communications of great importance almost certainly for the whole of the winter, and to put out of action a number of the enemy and of the traitors helping them.

Three attacks were made—on 18th, 20th and 22nd December, 1940. So that the crews taking part in them should have as clear an idea as possible of the nature and look of the place, they had been shown a pre-war travel film containing excellent shots of the station. the hotel and the surrounding slopes of snow. The first attack was only in part successful, for despite the film which they had seen and the special maps which they carried, several of the crews did not find the target. Two nights later it was repeated and Beauforts scored direct hits on the snow-sheds and the railway line. A train in the station took refuge in a shed from which it did not emerge. In the third attack the hotel was hit. It was subsequently discovered that two mechanical snowploughs had been destroyed in the railway station and that the line was, in consequence, blocked for many weeks. The leader of the

Finse. Attacks by Beauforts upon this Norwegian sports centre, used as a holiday resort by German officers, destroyed the hotel, damaged the station and blocked the railway line for many weeks.



first attack, carried out by Hudsons, flew up and down above the target with his navigation lights on, in order to show the way to the rest.

The part played by Coastal Command in the Combined Operations raid on Vaagso on 27th December, 1941, may be mentioned, for this operation was an attack on a fringe target carried out by the Royal Navy and the Army. It was the task of Blenheim fighters and Beaufighters of the Command to provide protection from the air while Blenheims of Bomber Command made an attack on enemy aerodromes within range. The sky was clear and the Beaufighters, which were over the target about 1.0 p.m., successfully prevented the German Air Force from interfering. Several combats took place; four He.111s were shot down for the loss of three Beaufighters.

One Blenheim returned to base with the observer and rear gunner both badly wounded. It fought two Me.109s over the ships and during this engagement the rear gunner was put out of action. It turned for home when it encountered a Me.110 very low over the water. The observer was attending the wounded rear gunner, whom he had taken from the turret. He manned the guns, but was himself wounded a moment later by a burst of fire from the Me.110. "Just then," reported the pilot, "I heard a swishing noise and spray flew in from my open side-window. An engine began to cough. I had hit the water with one propeller, but fortunately, beyond bending it a bit, there was no serious damage and the engine picked up again." Within 50 miles of base the observer succeeded in reaching the wireless set, though it took him ten minutes to cover the six feet separating him from it, and sent out a distress signal. The Blenheim, with flaps and undercarriage unserviceable, made a successful belly landing. The crew survived.

This account of attacks on land targets is best ended by the story of the Beaufort raid on the docks of Nantes on the night of 26th/27th October, 1941. The Beauforts set out in formation and flew a hundred feet above a stormy

"We were so low," says the leader of the attack, "that when we reached the French coast I had to pull up sharply to avoid the sand-dunes. Every time we came to a clump of trees we leap-frogged over them and then

went down almost to the ground again. . . . It grew darker as we went farther inland and then began the most surprising experience of all. It was as though the whole of that part of France were turning out to welcome us. Every village we went over became a blaze of light. People threw open their doors and came out to watch us skim their chimneypots. In other places hamlets would suddenly light up as if the people had torn the blackout down when they heard us coming. . . . I remember one house with a courtyard fully lit up. I saw a woman come out of the house, look up at us, wave, and then go back. She switched off the outside lights and then I saw a yellow light from inside stream out as she opened the door."

The docks were bombed from 300 feet. Then the Beauforts turned for home just above the roof-tops of Nantes, which, in the bright moonlight, "looked like a city of the dead." "Then I began to see white pin-points on the ground and one by one lights appeared as we raced over the chimney-pots. . . . We were at top speed, but even so we could see doors opening and people coming out. I felt that we had brought some comfort to the people of Nantes." They were in need of it. A cordon of German troops had for some days surrounded the city, and within there were fifty hostages awaiting execution as a reprisal for the killing of the German governor. These were shot the next morning. Yet the lights which were switched on that night have been seen on subsequent raids. Through them shines the indomitable spirit of the Bretons.

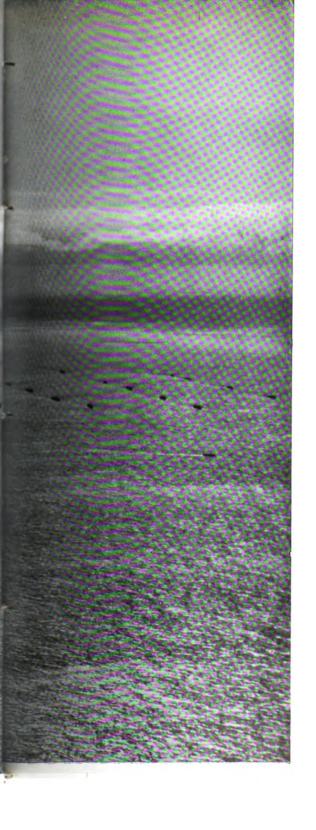
Attacks on land targets by Coastal Command have yielded in the last months to attacks on shipping. The work of dealing with U-boats and surface raiders in their lairs is now for the most part being performed by Bomber Command. Yet those earlier days when Blenheims, Hudsons, Beauforts and flying boats went in to the attack must not be forgotten. They harassed the enemy—some 6,000 metric tons of fuel oil were destroyed in two attacks on St. Nazaire alone, sufficient to fuel a U-boat for six to eight sorties—and prevented him from developing his full strength in the Western Approaches to Great Britain.

What is being done to attack the enemy lurking in the depths or in the skies of the broad Atlantic must now be considered.





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PROTECTING

THE OCEAN

CONVOYS

From Arctic to Equator, from Biscay to the American shores, the Battle of the Atlantic is being fought. In defence of our shipping, Coastal Command patrols more than half of this huge battlefield.

8: Ten Million Miles of Sea

THE BATTLE of the Atlantic is being fought over somewhat more than ten and a half million square miles of sea. The rough boundaries of this area are, to the North a line of latitude beyond the Arctic Circle, to the South the Equator, to the East the coasts of Western Europe and of part of Western Africa, to the West the Eastern coasts of Canada, Newfoundland, the U.S.A., the Central and certain of the South American States. Across this vast expanse of ocean, convoys carrying our vital supplies pass to and fro. They are escorted by ships of the Royal Navy and, in addition, as soon as they come within range, by aircraft of Coastal Command, which are the eyes of the ships and the arrows of the defence.

"Since the collapse of France," reported the Commander-in-Chief of Coastal Command in July 1940, "the activity of main importance has been air and submarine attacks on shipping. Germany's ability to make use of air bases along the whole of the Northern coasts of France has rendered shipping routes in the Channel and Western Approaches extremely vulnerable to air attack and has resulted in drastic alterations in the routeing of convoys. . . . In Coastal Command the effect has been to change the main centre of convoy activity to an area off the North-West coast of Northern Ireland and to give prominence to our bases in that part of the British Isles."

Steps were immediately taken to increase the number of bases and to make more use of those already in operation. Their importance may be judged from the fact that at one base in Northern Ireland alone 25,591 hours were flown on patrol between July 1940 and

November 1941. These bases form the Southern bastion of our Northern air defence. Its Northern bastion is elsewhere, in a foreign land whose shores, in places, cut the Arctic Circle.

It was realised that Scottish and Northern Irish bases alone would not be sufficient. Others had to be found from which to cover the North Atlantic. Coastal Command reached out and established itself in Iceland. That island, larger than Ireland, was occupied by British troops on 10th May, 1940. It was not, however, until 27th August that half a squadron of Battles landed near a little fishing village on its South-Western shores. The other half arrived on 14th September.

Their flight, though uneventful, was none the less remarkable, if the limited endurance of this type of aircraft is remembered. It had been necessary to wait several weeks for favourable weather, for the endurance of a Battle would not permit it to cross the seven hundred odd miles of sea separating Scotland from Iceland unless there was a tail wind or no wind at all. They flew in two groups of nine preceded and followed by a Sunderland to ensure that there would be no navigational difficulties. Before the eyes of the pilots as they drew near stretched a line of black hills bearing no trace of trees or vegetation save for an irregular pattern inscribed upon their dark flanks in streaks of yellowish-green moss. Beyond, seemingly but twenty, in fact some sixty miles away, the shapes of high mountains and the foot of a glacier a hundred miles long were to be perceived, now dim and hesitant, now clear cut and bold against a sky whose colour and texture were in constant movement.

On this land of savage yet delicate beauty the Battles alighted by the mouth of a river flowing through a desolate marsh of lava and grey tussocky grass which divides the dark hills from the sullen sea. They began at once to take their part in the fight, a part subsequently played by aircraft more suited to the purpose. Thus by September 1940 the Northern bases had been increased and reinforced.

In the West and South-West of these islands our bases have remained unchanged in number. Their activities, however, were intensified, so much so that in August 1941 the aircraft using them were finding and attacking U-boats at



the rate of one every other day in addition to maintaining patrols off Brest and the other French ports on the Atlantic seaboard to watch for any surface raider seeking to break out.

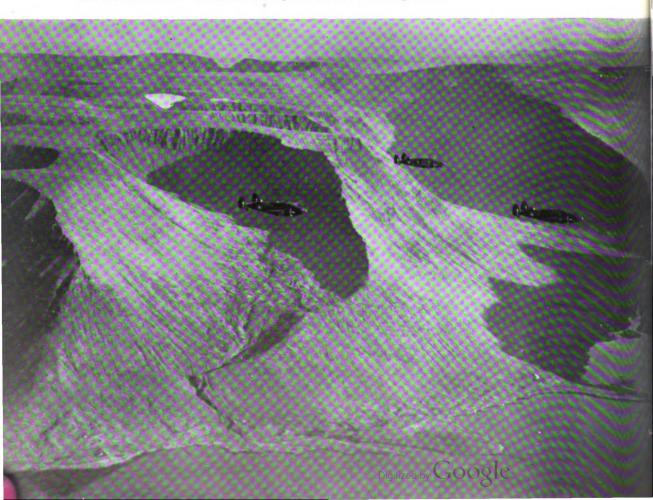
Coastal Command presently moved much farther South, a two days' flight from England, and in the first months of 1941 established a base on the West coast of Africa with a port of call at Gibraltar, which has been an outpost for flying boats since October 1939. Here, in the mouth of a wide river fringed with mangrove swamps and palm scrub, Sunderlands were stationed.

By the spring of 1941, therefore, it will be seen that much had been done to counter the

greatly increased striking power of the enemy. Aircraft of Coastal Command were established at various points along the Eastern boundary of the battle area from the hot South to the cold North.

Conditions in the North of this far flung battle line, which touches the Arctic Circle, differ appreciably from those in the South where it touches the Equator. At one station in Iceland the average temperature in December is 30 degrees Fahrenheit, falling sometimes to as low as minus 6 degrees, while at another in West Africa the average during the same month is 81 degrees in the shade, rising on occasions to 95 degrees. Yet the operational problem

Coastal Command in the far North. Hudsons flying over the stark and inscrutable face of Iceland—" black hills bearing no trace of trees or vegetation."





Wind-breaks, built of lava and turf, protect our aircraft from the fierce Icelandic gales.

is the same at any point along this front of some 3,540 miles.

Come first to Iceland. It is of vital importance in the battle. Were it a base for enemy U-boats the toll which Germany would take of our North Atlantic convoys would be many times greater than it is. A glance at the map shows how convenient is its situation. It is, to quote the Admiral in command there, "the Clapham Junction of the North Atlantic." As such it is heavily garrisoned by American and British troops and protected by units of the Navy and Air Force of both Allies. It is a strange country, warm and inviting in summer, at all other times stark and inscrutable. Within the whole circle of its coasts there is hardly a tree. In summer almost without darkness, in winter almost without light, it guards the secret of its sombre mountains, its still active volcanoes, its geysers and its glaciers, silent and aloof under the Northern Lights.

Aerodromes have been built in the lava swamps on which the Battles landed in August 1940 and elsewhere. The runways have been made of concrete and lava dust laid on a bed of stones. The aircraft are protected from the fierce and sudden winds by "breaks" fifteen feet high built in the Icelandic fashion of lava faced with sods of turf. The crews and ground staff live in Nissen huts, their chief enemy in autumn and winter being mud, in summer lava dust which spreads over everything, causes sore throats, and severely shortens the life of clothing and boots. The roads, of the consistency of a hard tennis court after heavy rain, are vile. Yet vehicles contrive to average a



Hacking on native ponies is a favourite recreation of Coastal Command airmen in Southern Iceland.



Bad weather is Coastal Command's most persistent enemy. In these northern latitudes, fog comes up quickly, obscuring airfields and grounding the aircraft for days on end.

thousand miles a month. Major repairs—the driver of a car and the officer with him once removed a broken back axle and fitted a new one, dropped from the air by parachute, with the aid of a hammer, chisel and three spanners—have often to be carried out by the roadside.

For recreation in the South of the island there is salmon and trout fishing, shooting in the marshes, duck, mallard and snipe for the most part, and hacking on sturdy Icelandic ponies, the most robust of the robust natives of the island. In the North such amenities are more rare. Football and other games are played, one strongly contested match which took place in winter lasting from dawn to dusk, a period of little more than an hour. The Army and the Royal Air Force exchange concert parties, and in the long, dark evenings of the Icelandic winter the men carve bracelets and rings from the perspex fittings of crashed aircraft. Officers and men do their own washing and darning, and all available packing-cases are turned into furniture for the huts.

The Battles were replaced by Hudsons in June 1941 for anti-submarine and convoy patrol. Sunderland and Catalina flying boats, Northrop float-planes, Wellingtons and Whitleys have operated from Iceland or are doing so. Their task is not easy, for weather conditions in and around that island are among the most variable in the world. It is almost possible to see the depressions off Iceland, in peace time so

prominent and disheartening a feature of the daily Press. Fog is frequent and clouds will move down upon an aerodrome faster than a galloping horse.

Above all there are the winds. These can reach more than gale force in a matter of minutes. At one aerodrome the wind once began to blow at 62 miles an hour. An hour later it was blowing at 76 miles and an hour after that at 89 miles an hour. The maximum velocity of the gusts reached 133 miles an hour. This hurricane turned the Guard Room on its side, took the roof off the Flying Control Headquarters, and caused six Whitleys to move along the runway from their dispersal point, each dragging with it six 300-lb. concrete blocks. "A Nissen hut took off at 10.00 hours," says the report, " and reached an estimated height of sixty feet before crash-landing on an adjacent runway. At another aerodrome near by the anemometer broke down after recording a velocity of 90 miles an hour. . . . The propellers of Hudsons were seen to be turning although the engines were completely cold." No aircraft was lost or damaged.

Despite the hostility of the climate the average number of hours spent each month in flying has been high. To ease the strain the time of patrols is reduced when possible. Other difficulties concern the behaviour of compasses, which vary often by as much as eleven degrees, and of wireless installations, which not infre-

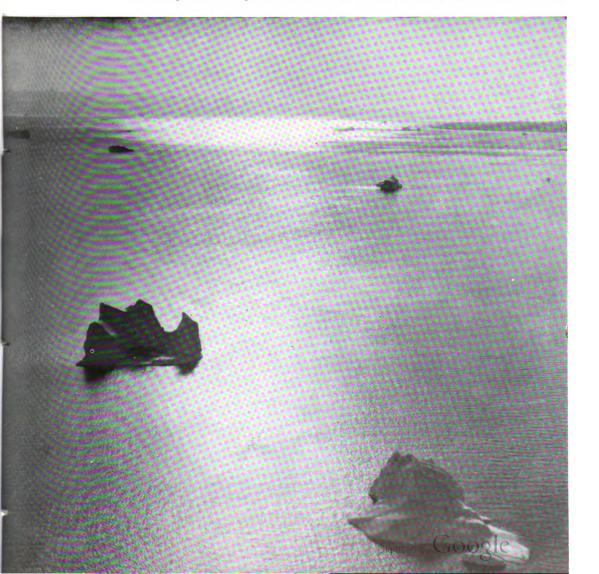


quently fade out entirely. It is, moreover, difficult to divert aircraft if their bases are obscured by fog or ten-tenths cloud, for landing grounds are few and far between. Once a Hudson was diverted to an emergency ground near the shore and it was ten days before it could take off again. During that time the crew consumed ninety-two tins of meat and vegetable ration and on their return regarded

bully-beef and biscuits with much the same feelings as the Israelites displayed towards the fleshpots of Egypt.

In addition to convoy and anti-submarine patrols and sweeps there is also the ice patrol over the Denmark Strait as far as Greenland and back. This is flown at frequent intervals in order to find out the extent and movement of the pack-ice. Fog is often troublesome and

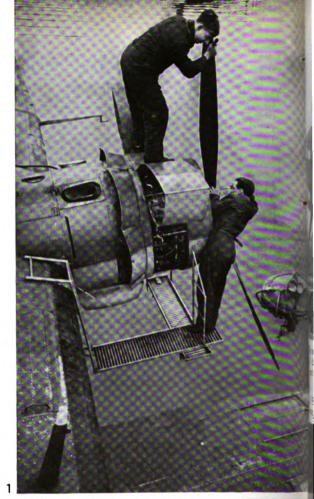
An ice patrol is flown over the Denmark Strait to Greenland, to investigate the movement of pack-ice and provide data for the calculations of the Meteorological Officers.

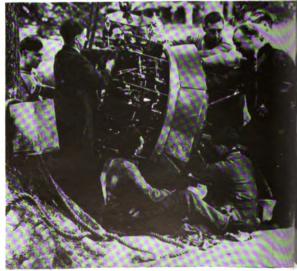


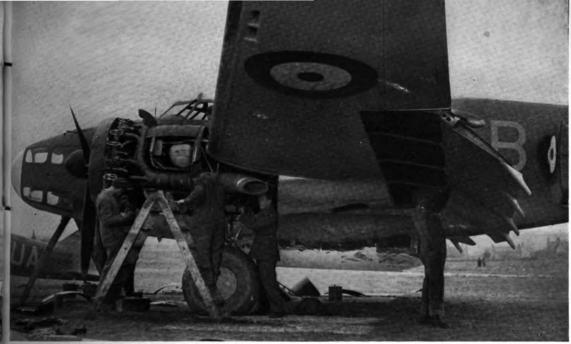
more than one pilot has seen an iceberg loom suddenly up on his port or starboard bow. Some of these are as much as seven hundred feet high. This patrol has of late been flown by our American allies, a detachment of whose air force has now been in Iceland for some time. Their desire to learn the conditions governing war-time, as distinct from peace-time, flying is equalled only by the modesty of their bearing and their eagerness to engage the enemy. They have become in a very short space as close comrades of the Royal Air Force as are the pilots and crews of the Norwegian Naval Air Arm. These men-most of them were once sailors-fly Northrop float-planes and have shown themselves to excel in the difficult art of navigation in Icelandic latitudes. The air forces in Iceland now form a separate group which works, as do all others in the Command, in close co-operation with the Navy

Some eight hundred miles to the South-East lie the next group of bases from which the battle is being fought. They comprise aerodrome and flying-boat bases and are situated on the West coast of Scotland and in Northern Ireland. Here the climate, though less rigorous than farther North, is very rainy and in winter can be severe. In that season blizzards make operations difficult, while at other times mud takes the place of snow. Much of the surface of Northern Ireland, and still more of the West coast and islands of Scotland, is unsuitable for aerodromes. Of those that have been constructed some are of necessity set close under ranges of hills, and this makes landing at night or in thick weather difficult and often hazardous. They are, however, the best available and are in constant use. At some the crews live in concrete huts widely dispersed, at others in hotels or country houses.

At one flying-boat station, hidden in gardens of grand design now half-wild and overgrown, amid a vast profusion of laurels, rhododendron bushes, oak and beech trees, stand Nissen huts, cook-houses, repair shops, officers', sergeants' and airmen's messes—all the varied buildings which house a station on active service. In the lough near by, which local tradition asserts contains as many islands as there are days in the year, Catalinas and Sunderlands swing at their moorings. They are serviced by ground technicians known as the maintenance "gang."







The men who keep the aircraft flying. On the work of the maintenance gang depends in the last resort the safety and success of the air crew.

- 1. Fitters, working on a platform high above the water, carry out their inspection.
- 2. Slung from a tree, the engine of a Catalina undergoes repair.
- 3. Servicing a Hudson: its tail is raised to the flying position so that the guns may be checked.
- 4. Only for major repairs are aircraft brought into the hangar.





A lough in Northern Ireland, used as a base for our flying boats, is another link in Coastal Command's chain of operations.

It is convenient at this point to explain the work they do at all flying-boat stations. Engineers on flying boats keep a diary of the behaviour of the engines. Thus there is available at any moment a complete picture of an engine. Its cylinder temperatures, pressures, petrol consumption—all are recorded, and any fault is at once dealt with by the N.C.O. in charge of the "gang," acting under the Engineer Officer of the unit. The engine inspection is carried out by fitters standing on a platform fifteen inches wide slung some twelve feet above the surface of the water. They do their work in all weathers without protection from rain or wind, and in winter it is often necessary to relieve them every hour. There is no "lee" side to a flying boat, for when moored it will always ride into wind. They must be very careful to hold on to their spanners and other tools; if they drop one it cannot be retrieved.

While the engines are being overhauled the riggers are busy inspecting wings, hull, tail-plane and the more remote parts of the boat. To avoid overcrowding, and therefore loss of efficiency, everyone works in turns according to a schedule. Thus the electricians will test all the bomb circuits before the armourer puts the load of bombs and depth-charges into position; the instrument repairers will check the instruments in the cockpit while the rigger is at work

elsewhere. When they have finished he takes their place and inspects the pilot's controls.

The "gangs" must be, and are, ready to cope with any sudden emergency. Once a Sunderland taxi-ing to moorings struck an uncharted rock. The pumps were started; the "gang" bailed with anything they could find and the boat was successfully beached just before she became waterlogged. The split in the hull was caulked with plasticine and pitch, and the boat was refloated and subsequently made serviceable. On another occasion a Sunderland was successfully prevented from sinking by lashing empty herring barrels to the hull. On the efficient performance of their duties by the maintenance "gangs" everything in the last resort depends.

In all this ground activity the part played by the Women's Auxiliary Air Force must not be forgotten. Passing references to their work have been made. Here, described by one of them, is some account of their many duties in Coastal Command.

"Just before he left the R.A.F., in a letter dated 4th January, 1935, AC/1 338171 T. E. Shaw, better known to the world as Lawrence of Arabia, wrote to a friend telling him that he had originally enlisted in the R.A.F. because it was the nearest modern equivalent of going into a monastery in the Middle Ages. That

was right in more than one sense. Being a mechanic cuts one off from all real communications with women. There are no women in the machines—in any machine. No woman, I believe, can understand a mechanic's happiness in serving his bits and pieces. Had he survived his road crash a month later and returned to his old Station to-day he would have found over 300 W.A.A.F. there, accepted by the R.A.F. as a normal part of Station life.

"The specific operational duties carried out by Coastal Command affect the work of the W.A.A.F. employed as Special Duties Clerks, in the Signals branches, and in the Intelligence branches.

"The part played in the staff side of operations is considerable. In a large and lofty room in the Command Operations Block a W.A.A.F. officer sits at a long table writing and making calculations. She is the Operations Room Plotter and she receives a constant stream of signals covering patrols, convoy escorts, reconnaissance flights and U-boats warfare. At her elbow are a number of large-scale charts covering the wide area over which Coastal Command operates. As the signals with coded map references pour in she translates the data into plots in latitude and longitude. Using compasses, parallel rulers and protractor, she pinpoints the chart, drawing pencil lines which 'lay off' courses and bearings of ships and aircraft and indicate areas to be patrolled. The chart may be a complete picture of the Battle of the Atlantic or other Coastal activities kept up to date minute by minute, showing the latest movements of ships and aircraft.

"Teleprinters are used to send and receive signals. When operating them the W.A.A.F. have to be absolutely accurate. One letter wrong in a coded signal can make the difference of several miles in direction finding—the difference between the crew of a Sunderland which has come to grief over the sea being lost or saved. Station signals are sorted and checked in the Traffic Room, where sit two airwomen whose job it is to log all Station signals and to see that all incoming signals are delivered to the right people with the minimum of delay. In the Command Operations Room are also to be found the W.A.A.F. Wireless Operators. They receive and transmit Morse messages to and from the aircraft.

"There are many additional duties. The care of maps and charts is one of them. The W.A.A.F. clerk will produce those required by a crew for the operation they have been detailed to carry out. She has been selected for her knowledge of geography. She must know the quickest route, the most dangerous, or the safest to any part of the world. Relief maps used by air crews are coloured in gradations of purple. It is the easiest colour to see in the dim light of a cockpit.

"On a number of Coastal Stations the Code and Cipher officers have been made responsible for giving the air crews their code books and identification signals before they take off on operations. The Waaf's attitude to air crews with whom she may come in direct contact at moments like these is rather like a nurse's attitude to a young surgeon about to perform an operation—a kind of clinical good humour.

"The Post Office has proved that, as a general rule, a woman has a better telephone voice than a man. They have found this in the R.A.F. too. Hence the W.A.A.F. Radio Telephonists who speak to the pilots and radio operators of air-borne craft and give them their bearings and landing directions.

"On another part of the Coastal Command Station, probably near the Operations and Crew Rooms, is the Ration Store. Here air crews collect their rations, which are prepared and issued by W.A.A.F.

"On all operational Stations in Coastal Command there is a parachute packing section. Parachutes are packed in a room like a squash court. They are hung from the ceiling for several hours to remove creases before packing —60 yards of white silk. The R.A.F. Corporal in charge says that parachutes can be packed in half an hour, but no one is encouraged to do this in under forty minutes. The airwomen "on the job" half sit, half lie on the long, polished tables, and do not smoke or talk while they work. If a parachute is packed incorrectly or carelessly it might not open properly when the rip-cord is pulled.

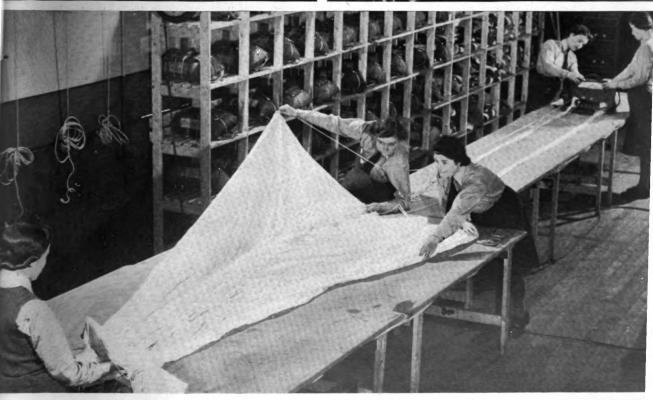
"One of the strangest jobs that W.A.A.F. do in Coastal Command is pigeon-keeping. Homing pigeons are used for emergency messages from aircraft and a W.A.A.F. must be able to train and handle the birds and also to instruct the air crew how to manage them



The W.A.A.F. turn their hands to many jobs in Coastal Command—putting the air crew's equipment aboard, testing sparking-plugs, cooking for the mess, packing parachutes.







and care for the equipment on Service flights.

"In the Photographic Interpretation section of Coastal Command there are W.A.A.F. Intelligence Officers who examine all photographs taken. Their interpretation is a very specialised job, and the officers must have a comprehensive knowledge of maps, charts and geographical plotting. From almost microscopic bird's-eye views they build up accurate reports on the enemy's armed forces, communications and industry.

"When the Station is situated on the sea and there is a Marine section you will find the W.A.A.F. employed in the direction of the launches and pinnaces that ply between the flying boats and the land. At night they are responsible for the movement of the dinghies that are used for the water flare-path.

"In the hangars are W.A.A.F. Charging Board Operators, whose task it is to charge the accumulators in the sheds or in small caravans which may be moved from hangar to hangar. These girls must be robust, as the accumulators are heavy.

"Fabric Workers spray the camouflage paint on aircraft, stitch the wing fabric, make new parachute cases, and generally do most of the patching, making and repairing that is to be done on a Station.

"Finally there are the Sparking Plug Testers. Who can see them at work without appreciating how well these W.A.A.F. understand a mechanic's happiness at serving her 'bits and pieces'?"

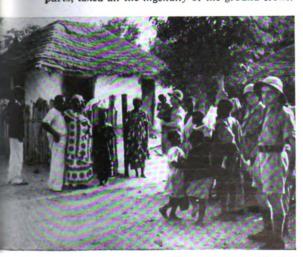
South from Northern Ireland the next bases are to be found in South Wales and the South-West of England. Here the climate is better and the number of days when, as far as the weather goes, patrols are often a delight is therefore larger. The work is the same. Some stations are the permanent homes of Coastal Command squadrons. Of these there is one where the bond between the Royal Navy and Coastal Command is especially strong. On the waters of its harbour Sunderlands ride at their buoys where the "Golden Hind" dropped anchor, where Admiral Montague landed after the Glorious First of June, and where "Ajax" and "Exeter" were acclaimed after the battle of the River Plate. From this base patrols have been maintained since the early days of the war over what was then known as the Western Approaches and into the Atlantic as far as the coasts of Spain. The pilots and crews stationed



African villages, huddling between surf and jungle, were a familiar sight to Coastal Command.



Maintenance work at the West African bases, owing to the climate and the difficulty of getting spare parts, taxed all the ingenuity of the ground crews.



The natives are friendly.

at other bases in this area, flying Hudsons, Blenheims and Beauforts, know the Western and South-Western coasts of France as intimately as those of Devon and Cornwall. For many of them the battle means constant patrols off France and close acquaintance with the Bay of Biscay.

So much for the centre of the long line. At its extreme Southern end there are the West African bases of the Command.* On the way there is Gibraltar, where a flying-boat base was established within the first month of the war. It is a useful and important port of call, and many patrols are still flown from it. Sunderlands first arrived in West Africa in the spring of 1941. They were joined by Hudsons in the middle of June. The crews and ground staff lived in tents till one night these were washed away. They found refuge in a church. In the rainy season water penetrates everywhere, even through the hulls of the flying boats. Malaria and mosquitoes are ever-present and eager foes. From the first, difficulties of maintenance, though severe, were not allowed to retard or hamper operations.

The Sunderlands began the work of convoy escort immediately. They were badly needed. The main difficulty in those days was to obtain sufficient quantity of spare parts to keep the flying boats serviced. Much ingenuity was shown. Oil for the hydraulic gear was obtained from ground-nuts; packing-box nails took the place of split-pins; brown paper was used to pack pipe-line joints, toilet paper for oil filters.

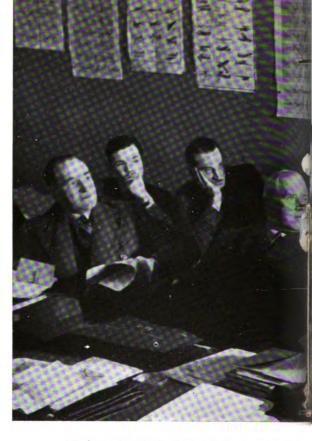
The Hudsons also carried out many patrols. They flew the first of them twelve days after their arrival, and in less than a fortnight the crews and ground staff had constructed a base out of what was little better than a tropical wilderness where the grass was eight feet high and the inhabitants mostly aggressive and hungry mosquitoes. Their flight to West Africa was in itself a remarkable achievement, for they had had to cover more than 1,800 miles without alighting. In a hundred and fifty-four days they carried out a hundred and forty-one patrols. In October one of them scored a hit on the deck of a U-boat trying to crash-dive. It disappeared leaving a trail of oil and bubbles and was considered destroyed.

These have recently been transferred to another Command.



IN THE EARLY DAYS of the war our convoys were covered by Coastal Command either when approaching these shores or when sailing coastwise. With the increase in the range and number of the aircraft at its disposal, Fighter Command can now give protection to ships within a certain distance of the shore by means of a "fighter umbrella." This need not always be spread above the ships but can be opened when necessary. Coastal Command has, in consequence, been able for many months past to concentrate on giving more distant cover. The first to meet the convoys are the Catalinas. They do so many hundreds of miles out in the Atlantic, for the normal duration of their patrol is, in summer eighteen, in winter fourteen hours, and it is possible for them to remain air-borne for considerably more than twentyfour hours. Close behind them come the Liberators and the Sunderland flying boats. Then the Whitleys take charge, followed by the Wellingtons and, as the long journey nears its end, the Hudsons, the long-range fighter Blenheims and Beauforts, and until lately the Ansons.

Thus, in theory, the protection afforded to convoys from the air, once they have reached a certain point, is in daylight continuous and more intense as they near our coasts. In practice this is not always so for a reason which is easily apparent. A convoy keeps wireless silence. It must do so if it is to preserve the secret of its whereabouts. Unfortunately, this is hidden alike from friend and foe. True, the Admiralty knows its port of departure, its speed, course and destination. Where it is can therefore be plotted on the great wall maps in Whitehall, at Coastal Command and at the Area Combined Headquarters. There is, how-



The men who sail the ships. At the convoy conference, Merchant Navy skippers receive detailed instructions on enemy tactics and the methods

ever, one factor which cannot be exactly calculated or known. It is the weather.

When a convoy runs into heavy weather its progress becomes slower. This, however, is not immediately known in this country. An aircraft, therefore, sent to find the convoy and given the position in which it ought to be may not find it there and may have to search sometimes for hours. On one occasion, for example, nine aircraft were sent out from a station in Northern Ireland to cover a convoy which was, in fact, several hours ahead of the moment at which it was scheduled to pass a given point. They did not find it, but a long-range Hudson, sent out later, did so after searching for six hours. It had time to signal that it was going back to base and then had immediately to do so, petrol being low. Once a Catalina from Northern Ireland was sent to meet a convoy having the code name "Child." After some hours the Controller at base received the



by which to combat them. Co-operation between merchant vessels and their naval and air escorts has been brought to a fine art.

message "Pregnant" followed by the position.

The successful meeting of aircraft and convoy is the responsibility of the navigator. His task and difficulties merit examination. In the crews of Coastal Command the navigator is perhaps even more than in Bomber Command the key man. He is faced with a set of navigational problems which change literally with the changing wind. His craft is not moving in an element of which the tides and currents have been known, charted, and tabled for hundreds of years. He has no such exact information but must rely upon a weather report and forecast. Changes in the direction and speed of the wind through which he is to fly cannot be recorded accurately in advance. Temperatures and pressures vary with every change in the cloud formation. Each flight is indeed a navigational adventure. The problems of navigation are much the same when flying over the Atlantic as were those which beset Columbus when sailing upon its surface, though in place of the saliva spat by a seaman over the bows of the "Santa Maria," by the behaviour of which the Admiral was wont to calculate the drift of the ship, the navigator of an aircraft of Coastal



The men who protect the convoys. A Catalina crew goes out to the aircraft in a launch.



They climb aboard through one of the glass "blisters" in the hull.



Command has drift sights and flame floats to aid him.

To keep the aircraft on its proper course the navigator must know two things: the extent to which the wind is causing it to drift from the track plotted on the chart, in other words, the angle between the course actually flown and the course plotted (track), and the true speed at which the aircraft is flying, that is the speed at which it is, in fact, passing over the sea. The calculation of these two factors enables him to navigate by Dead Reckoning, the method in universal use by the Command.

To find the amount of drift, the navigator makes use of the bomb-sight, the tail drift sight or the observer's bearing compass. The drift wires of the bomb-sight, for example, are aligned on some object in the sea, such as a wave cap, until that object appears to travel directly along the drift wires. The drift of the aircraft is then read off on a scale. The tail drift sight, used more often at night, is constructed on the same principle as the periscope. It passes through the floor and is directed astern. Objects passing directly below the



The navigator is responsible for the successful rendezvous between aircraft and convoy at a prearranged point in the vast wilderness of water. Every patrol is a navigational feat.

navigator are picked up, followed astern and kept between the drift lines of the instrument by moving it to port or starboard. The degree of this movement is read off on a scale similar to that of the bomb-sight. Sometimes, especially in very calm weather, smoke or flame floats are used as objects on which to train this sight.

There is also the bearing—wind—compass. This is sighted on the wind "lanes" appearing on the surface as the wind strikes the water. Whatever method is used, one phenomenon is noticeable—from an aircraft, the spume of a wave always seems to move up-wind, for the wave is travelling faster than the spume.

To calculate the ground speed as distinct from the air speed, the true direction and speed of the wind, the Wind Velocity, as it is called, must be found. Several methods are in use. In one the aircraft alters course three times. During its progress along each new course the navigator takes a drift and from this the wind velocity can be calculated. In another the wind lanes are used in a way similar to that already mentioned. With practice, very accurate results are achieved.

So much for Dead Reckoning. There are other ways of navigating. First by wireless bearings or a "fix," which is the intersection of two or more bearings or "position lines," as they are called. These are obtained from the shore, but as wireless silence is the rule, they are never asked for except when the aircraft is well away from a convoy or has encountered very thick weather and cannot make a landfall. The navigator can, however, obtain his position lines without breaking wireless silence with the aid of the Loop Aerial, by which he takes a bearing from the various wireless beacons situated round our coasts.

There is finally astro-navigation, the taking with a sextant of sights of the sun by day and of the heavenly bodies by night. This method is much used by the flying boats on their way out to a convoy and back from it.

All observations, by whatever means they are made, must be transposed by mathematics into a simple order to the pilot to alter course so many degrees. The pilot has a very important part to play, for he must be able to steer an accurate course at a given height, since height, temperature and barometric pressure have all



The pilot of a Coastal Command aircraft must fly an accurate course, through constant changes of wind and weather. His work is exacting, monotonous, seldom dramatic.





On patrol. The midship gunners of the flying boat are alert at their stations. Below, in the crew's quarters, the "watch off" takes it easy.



The flight engineer watches his instrument board, which tells him how the engines are behaving. Any fault must be corrected instantly, when an aircraft is so far from land.

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to be taken into exact account. The height is altered from time to time to allow for every phase of weather through which the aircraft may have to pass.

Every alteration of course and the record of every calculation of drift is recorded in the Navigator's Log. A specimen page, slightly altered for reasons of security, is reproduced with this chapter.

It will at once be apparent that navigation needs knowledge and skill. When both are displayed the results, to a layman, are remarkable. A civilian on passage to Iceland found the aircraft to be forty seconds ahead of the estimated time of arrival after more than six hours' flight out of sight of land, while on the return journey he first saw land through the mists of an autumn afternoon two minutes earlier than had been promised five hours before though the aircraft had had to fly against a wind estimated by the navigator to be blowing at sixty-seven miles an hour, enveloped in cloud reaching down to within fifty feet of the surface of the sea.

The first Catalina to fly to Russia made landfall at a landmark indicated to the navigator seventeen hours before in the Operations Room at base. Such feats of navigation pass almost unnoticed in the Command. They are the rule, not the exception.

With the tasks and responsibilities of the navigator in mind it is time to come out in a Catalina flying boat on convoy patrol. That is the best way to appreciate the significance, the monotony and the importance of this operation. It is repeated day in and day out except in weather so bad as to make flying out of the question. Of all the duties performed by the Command it is the least spectacular and the most vital.

You will be on duty one way and another for some twenty-two hours. Wakened, say, at midnight, the crew breakfast twenty minutes later. If the Catalina carries her full complement they should number ten—two pilots, one observer-navigator, two fitters, one of whom is a flight engineer, two riggers and three wireless operators. All of them, in addition to the special duties they perform, are trained air gunners. While the captain, navigator and senior wireless operator go for briefing to the Operations Room the rest of the crew collect

the rations, get on board and prepare for departure. They are joined by the others about 1.15 a.m. At the briefing, which has not taken long, they have received the Form Green. The orders on it are complete but laconic: L for London, in which aircraft you are about to fly, has been detailed to give "antisubmarine escort" to convoy ZW65. It is made up of 49 merchant vessels moving at a speed of x knots. Particulars of the naval escort accompanying it are given and the position in which it should be found at dawn.

A quarter of an hour after the captain and his companions have come on board, the rigger prepares to let go the moorings. One of the fitters then starts first one, then the other engine by means of the auxiliary power unit. This

The front gunner of a Catalina. He must be incessantly watchful, though many months may pass before he gets a Focke-Wulf in his sights.





The radio operator has a specially responsible task in Coastal Command, so much of whose work is reconnaissance.

fills the boat with fumes, which will disperse when she is in the air. The engines are warmed up one after the other, so that the flying boat turns in circles first one way, then the other, like a mayfly in the eddy of a stream. The Catalina then taxies slowly to the flare-path laid out on the surface of the harbour, loch, or estuary where the squadron is based. It consists usually of three dinghies, decked and crewless, bearing each a six-foot pole on which are two lights. one dim for use on clear nights and the other bright, to be turned on when the air near the surface of the ground is thick and misty. The flare-path dinghies are moored in positions which vary according to the direction of the wind. At 1.55, after the rigger has reported that all hatches are closed, the klaxon sounds. The Catalina moves slowly at first, then with swiftly-gathered speed. The take-off has begun.

To the right from the cockpit windows, low down and hardly to be discerned in the darkness, two paths of foam appear, the outer a white gash made by the starboard float on the black surface of the water, the inner a broad ribbon faintly luminous beneath the rushing hull. As soon as the flying boat has lifted on to the "step" which divides her bottom into two parts, the floats are retracted, thus increasing her speed and the lift of her hundred-and-fourfoot wing. If the boat be heavily laden or the weather conditions poor, fifty to sixty seconds or even more may pass before the flying boat is air-borne. In favourable conditions that time is much less.

The pilot takes her off the water; while he is doing so the navigator gives the course to be steered. One fitter is now keeping the first engineer's watch, his eyes on the panel, partially duplicated in the pilot's cockpit, which shows by means of dials and gauges the manner in which the twin engines set close together above the hull are performing their office. Sometimes it may happen that one or more of these instruments may register an engine fault, such as



At 6.30 a.m. one of the riggers serves breakfast. Much thought has gone to discovering the ideal diet for these long, fatiguing patrols

falling oil pressure. When this is so it is the duty of the fitter to make sure that the fault thus indicated is in the engine itself and not, as sometimes happens, in the recording instrument. He communicates with the pilot by means of a small electric telegraph similar in principle to that used on shipboard. The other fitter is off duty resting together with one of the wireless operators on the bunks, of which there are four, situated in the after cabin. One wireless operator is on watch.

If conditions are favourable and the aircraft be given a steady course, the pilot may relax and throw in the automatic pilot—" handing over to George," as it is called. The "blisters" are manned each by a man. Presently a cup of tea, coffee, cocoa, or meat extract is drunk and afterwards the second pilot relieves the first, for the Catalina has now been flying two hours and that length of time is the normal spell of duty for all alike.

At 6.30 a.m. one of the riggers, if possible a married man, for married men make the better cooks, serves breakfast. It is the first of the four main meals which you will eat during the course of the patrol. The feeding of flying crews has been the subject of close attention on the part of the medical profession. It has taken some time to discover an ideal diet. In the early days the crew drew rations in bulk and these consisted

* Here is a typical menu for one sortie:-

Breakfast

Cereal Bacon and sausage

Bread and butter or margarine

Lunch

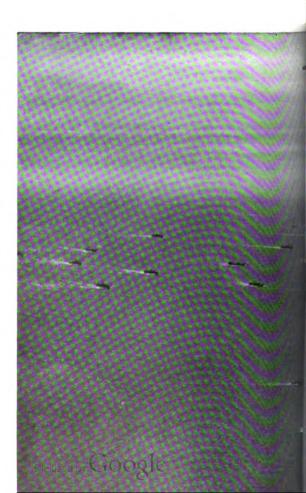
Soup Half the quantity of steak carried cubed and stewed Potatoes and vegetables Dried fruit Orange

Tea
Poached or scrambled egg
Bread and butter
Tea

Supper

Remainder of steak fried Potatoes and vegetables Bread and butter and cheese of whatever was immediately available. It was presently noticed that the fatigue from which they suffered on returning from the long sorties they made was severe. The time it took them to concentrate their thoughts and reply to questions during their interrogation was considerable and there were many complaints of air sickness.

To overcome these troubles it was decided to give them a full and balanced diet similar to that available on Sunderlands, which possess better cooking facilities. Between the four hot meals chocolate and barley sugar are eaten, and cocoa, tea or other hot drinks are provided by the cook, so that the crew can eat or drink something every two hours. The introduction of this balanced diet led to an immediate and very



great improvement in the physical well-being of the crews.*

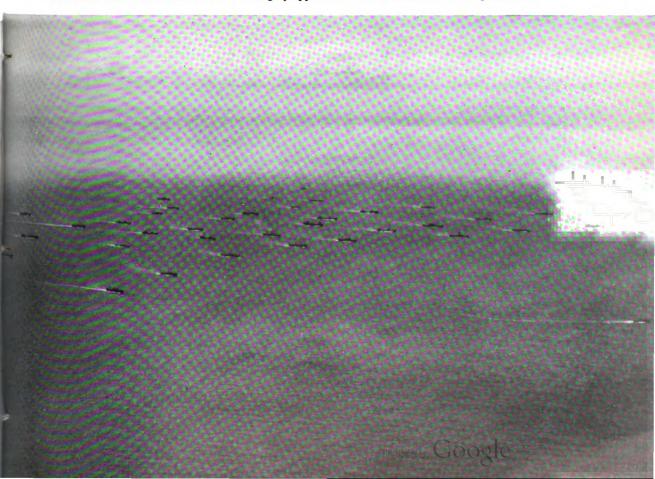
At first light, all who are not resting are maintaining a keen look-out for the convoy, which the navigator expects to sight at 7.30. A little colour has come back into the sea; not much, but with dawn it is no longer a dull black to be perceived now and again as a background to a wave crest itself barely visible. It has changed to grey, for this morning a screen of cloud is spread above the Atlantic. From 1,000 feet the sea looks as grey and solid as the mud-flats of an estuary and the white streaks painted on its surface by the wind seem like the pools and rivulets left on these weary expanses by the retreating tide. Here and there—for at moments the sunlight pierces or filters through

the screen of cloud—patches of emerald green are to be perceived, changing even as the eye catches them to the colour of a peacock's wing. This weather will endure until the afternoon, when a "warm front" will be met with on the return home. The cloud screen will then become a veil trailing over sullen waters.

At 7.53 a.m. numbers of smoke trails are visible fifty miles away. These grow in shape and volume until the ships from which they rise can clearly be seen steaming in three long lines with their naval escort beside them. The convoy has been found. Let a pilot who has seen many describe the scene.

"These Atlantic convoys," he says, "are always a grand sight when you come upon them in the early morning. The daylight is filtering

[&]quot;These Atlantic convoys are a grand sight when you come upon them in the early norning. The ships in their neat formation have a sort of waking-up appearance—like some trim little village at dawn."





A recognition signal is flashed by Aldis lamp as soon as aircraft makes contact with convoy.

now through the thick cloud, and the ships in their neat formation have a sort of waking-up appearance to them—rather like the feel of some trim little village you come across at dawn having driven along darkened roads all night, curtains being drawn back from cottage windows, a labourer whistling as he turns towards the farmyard, a freshness about the flower-beds in the gardens. . . You have the feeling that the convoy is stretching itself, shaking its shoulders and preparing for another long day."

The recognition procedure is put into immediate operation. The light from the mast-head of a corvette or a destroyer begins to wink. This procedure is very necessary, for the men on board the ships have vigilant eyes and light fingers. They carry aircraft silhouette cards on the bridge and they know the type of aircraft they ought to see in the neighbourhood of their convoy. But they take no chances; and rightly so. "Shoot first and argue afterwards" is an excellent motto in a battle such as this, all the more so since the pilots and

crews of Coastal Command know what to expect and act accordingly.

Merchant captains and their second officers have learnt what British aircraft are likely to be on patrol at a conference which they attend before setting out on the round trip to and from these shores. Among other information they are told what are the areas in which air attack may be expected, what tactics the Luftwaffe is using and how to combat them, the best ranges at which to open fire with the type of armament their ships carry, and much else of a secret nature. Above all it is impressed on them that the aircraft of Coastal Command are on patrol above their heads not only to give warning of the approach of a U-boat or to drive away a Focke-Wulf, but also to help them in any way they can.

Such conferences have proved their worth. They are an important means of establishing and maintaining mutual confidence between the men on the sea and the men in the air.

The correct signals have been exchanged; the Catalina has been duly recognised. This done, it begins a patrol which lasts for between six and seven hours. Perhaps it may give the convoy its position, for the ships may have experienced thick weather and have been unable to take sights for some time. This is a service much valued and appreciated.

Up and down, round and round it flies, watching and watched. That wake three miles to port may after all turn out to be the wash of a periscope. But as the Catalina approaches hope pines and dies. It is the track of a whale or a porpoise, which are to be found in the North Atlantic more commonly than is generally supposed. No Kurier breaks the screen of cloud or is to be seen weaving over the water towards the convoy. This is to be one more of those sorties with nothing much to report at the end of them, another eighteen hours or so to add to the hundreds already to the credit of the crew. But you perceive, as these hours pass, that monotony has not bred contempt, and it becomes clear to you that the vigilance so constantly and so quietly exercised is of the same pure quality as it was when a patrol such as this was a new adventure, the beginning of an operational career.

At 12.30 lunch is served. You eat it with the plate balanced on your knees, or if the navigator

is not too busy, on his table. There is not so much room in the Catalina as there is in the Sunderland which will take over at 3.0 p.m. In that boat there is a saloon with portholes and a table which can be laid with crockery, and next door is a big galley with two primus stoves and beyond a cabin for the crew hardly smaller than the saloon. Presently it is to be seen approaching. The letter of the day is flashed; "Returning to base. Good luck," is signalled to the convoy, and the long journey home begins.

It differs but little from the journey out except that most of it is performed in daylight which presently becomes murky and half-hearted, for the "warm front" has come up as the Met. Officer prophesied. The Catalina moves forward through the whorls of vapour, swaying a little to the now risen wind. The navigator spends much of his time gazing through the bomb-sight at the bearded seas

moving past beneath. As you draw nearer to land he makes frequent use of bearings obtained for him by the wireless operator from the different wireless beacons available. Soon after 7.0 p.m. the captain and the second pilot are seen to be relaxing. Their gaze is no longer straining through the sloped perspex of the cockpit. Their airman's and their seaman's sense perceive the loom of the land. When its presence is announced they shift a little in their seats, eat an apple, and presently take over from "George."

At 8.0 p.m. the Catalina is over base. It circles the control point till the look-out acknowledges its signal and flashes a green light to signify permission to land. This manœuvre can be carried out in one of two ways according to the state of the water. If it is rough the captain will make a glide approach into wind and go down to within a few feet of the water.

A naval escort vessel has swept out to investigate the aircraft. The men on these ships have vigilant eyes and light fingers.



He will then flatten out before touching down at about 80 knots. In a glide landing the sound of the water against the hull is the same, many times magnified, as that made by sand-paper rubbed along wood. If the surface of the sea is smooth and glassy he will make a long, flat approach with his engines partially opened up and will only ease back the throttles after he has touched down. This is known as "flying on."

When the Catalina begins to taxi to its moorings a rigger, having dismounted the forward gun, stands by in the nose to pick them up and two members of the crew man the drogues used to check the speed and thus to make the operation of mooring easier. As soon as it is completed the engines are stopped; a pinnace to take off the captain and observer for interrogation comes alongside. The patrol is over.

Of the perils encountered by the aircraft of Coastal Command engaged in their long and unremitting task little has been said. It is a temptation to take them for granted, as do the pilots and crews. The chief of them is not flak

nor fighters but weather. However skilful may be the Met. forecasters, they cannot be infallible. When they err, or when, rather, they do not foresee everything, an aircraft or a flying boat may not return.

On 20th October, 1940, a Sunderland set out at 5.0 p.m. from a Scottish base on a special mission closely connected with the battle. Two hours later a magnetic storm of the first magnitude developed. This put the wireless set partly out of action and gravely affected the compass. After seven and a half hours the Sunderland succeeded in making a signal saving that it was returning to base. It received none of the replies sent in return. Five hours later an SOS followed by a request for bearings was picked up at base and Group Headquarters. By then it was six in the morning but still dark. The Sunderland, its compass unserviceable, was lost and had no fuel left. The captain decided to alight.

The gale was now blowing at eighty miles an hour and the navigator judged the waves to be more than twenty feet high. Three flame-floats were dropped, but they did not burn, and the



"While returning to its base, the aircraft ran into bad weather."



Reqd. True Mag. Course Time Distance True OBSERVATION Track Run Course 1020 1025. 1030. 1035. 155. 1230. 1232 1242. 1245 1300 1305. 1530 1620. 630 105 1642 124 105

Nice work! A specimen page from a navigator's log, slightly altered for security reasons.

direction of the wind was gauged by a parachute flare. The captain brought the flying boat down in the trough between two waves. It was lifted up by one of them, so large and powerful that it took all flying speed away from the boat, which came to a halt with both wingtip floats intact. The crew were at once prostrated by violent sea-sickness and this endured for many hours. The wireless operators began to send out signals, not knowing if any would be received. One was, and they presently picked up a message telling them that a warship would arrive in eight hours.

The Sunderland continued to drift in tumultuous seas at a speed of about eight miles an hour. How long she would endure the buffeting it was hard to say. The wireless set was dismantled, repaired and reassembled. The signals subsequently made were picked up by the warship, faint at first, but strong after midday. At 2.20 p.m. the Sunderland signalled: "Hurry, cracking up." Fifteen minutes later she was sighted and the look-out on the bridge of the warship read the word "hurry" flashed by a lamp. At that moment as the crew caught sight of the warship a wave larger than the rest struck the Sunderland head on. She began to break up and the crew—there were thirteen of them—were flung into the water.

The captain of the warship manœuvred her so as to approach the wreckage of the flying boat from the lee quarter. He took the way off his ship as the crew swept past abreast of, and almost as high as, his bridge. A Naval Commander and twelve ratings with lines secured to them went over the side and pulled on board nine of the crew, who had then been fifty minutes in the sea. The other four were lost. The Sunderland had remained afloat in a full gale for not quite nine hours. The name of the warship was H.M.A.S. "Australia."

Next to weather and a long way behind in importance is the danger of engine failure. This is comparatively rare, for design and craftsmanship have improved almost beyond measure since the last war. Even modern engines, however, cannot always be relied upon to stand up to the great strains put upon them by constant use in all conditions of weather. Moreover, some of the bombers which it is necessary for Coastal Command to employ in reconnaissance duties must continue unfalteringly to

patrol at an average height much lower than that at which they were designed to fly. Overheating is sometimes the result.

On 24th October, 1941, at 7.30 a.m., for example, a Whitley far out over the Atlantic developed trouble in its port engine. Height was maintained on the starboard engine for two and a half hours by running it at 2,600 revolutions and plus six boost.* At the end of this time "the solder was running out of both engines," reports the pilot. "I attempted to land into the wind at right angles to the swell," he continues. "This was where I made my mistake. I touched the swell amidships; then the nose of the aircraft struck it, smashing the gun-turret, which suddenly appeared through my windscreen. . . . For the two and a half hours during which I kept the aircraft in the air we were constantly sending out messages indicating our position." So accurate was the navigation of the observer that aircraft sent to the rescue found the Whitley five miles only from the position it had last indicated. The crew were picked up.

In the same month, many hundreds of miles to the South, a Hudson was forced to alight in the sea 135 miles from the coast of West Africa. "The crew swam to the dinghy, which was still not inflated and on arrival was found to be inverted. . . . Almost immediately after this two sharks arrived and circled, one with fin above the water and the other well below the surface. In driving them off the dinghy pump was lost. For some time no further action was taken with regard to the dinghy as our attention was fully occupied with the sharks: clinging to the dinghy and so positioned that each could see behind his opposite number, a good watch was kept. The sharks were frequently driven off by splashing." The crew eventually succeeded in boarding the dinghy, from which they were rescued some forty-eight hours later.

There is also the Whitley on patrol two hundred miles off Iceland on Christmas Eve, 1941. At 3.49 p.m. its base received the following message: "SOS. Am landing in sea. Merry Christmas." It is pleasant to record that the Whitley got back on one engine and landed safely.

One other danger must be mentioned,

^{*} Supercharger.



intangible and difficult to assess though it be. It is the effect on pilots and crews of the monotony of their task. This monotony results in strain which sometimes has a curious effect on the mind. "I have more than once found myself making a sudden, steep bank when 500 miles out in the Atlantic under the impression that I was avoiding a mountain," confesses a General Reconnaissance pilot. "One of my friends, shortly before he went on his rest, swore he saw a man riding a motor-bicycle 450 miles off the West coast of Ireland."

"With luck," writes another with eleven hundred flying hours to his credit, describing the daily round, "we arrive at our patrol area in six hours. On the other coast of England the bombers are arriving home. Our work is just beginning—the hunt for submarines. . . . Sometimes we imagine they are a myth. It is not easy to go on believing in something you have never seen. . . . We are for ever searching for signs of the enemy. But nothing appears. Even the waves are formalised into the monotony: each one exactly like its predecessor. The wireless operator is receiving and sending, but his woodpecker taps are drowned by the engines. The navigator is bent over the chart table, plotting courses—sometimes going for ard to check the aircraft's drift. One of the fitters is working on the clocks and gauges, noting down temperatures, pressures, and petrol consumption. The air gunners lead the most frustrated existence of all. They sit and wait and watch and wait, hour after hour, day after day, month after month. They lean on their guns praying for a glimpse of the enemy." But the same pilot adds: "We have helped twenty great ships to-day to bring armaments and food to England. That is our reward."

It is indeed, and the words of the Master of a merchant vessel may serve to confirm those of the pilot. "The first flying boat to appear on this recent occasion," he writes, "found the convoy in the early hours of the morning while it was quite dark and we still had, as escort, the pleasant company of a Sunderland at midnight the same day. I know it must be very monotonous at times to the men of the Royal Air Force Coastal Command being on patrol duty, but I would like them to know what a thrill it is to us seamen—I know I speak for all -to see them around us and what confidence it gives us. I would also add that we enjoy their company after trudging along at slow speed for twenty days or more; it heartens us."



10: The Attack on the U-Boats

COASTAL COMMAND has, broadly speaking, three methods of dealing with a U-boat once it has left harbour and is on the high seas seeking its prey. It may be discovered by an anti-submarine patrol in the areas where these operate. It is then attacked by the patrolling aircraft and subsequently by others sent, in response to a signal, from the nearest base if it be within range. Such an attack is called a U-boat "strike." The enemy submarine may also be found by aircraft engaged on a sweep or a special search. That is the second method. The third is used when the U-boat is near a convoy. If sighted it will be attacked by the aircraft detailed to give protection to that convoy. A U-boat at large has therefore to run the gauntlet twice and perhaps three times on the way out and the same number of times on the way back. Moreover, signals sent by an aircraft reporting that it has sighted a submarine are automatically picked up by other aircraft and by vessels of the Royal Navy. Any in the neighbourhood immediately proceed to the attack.

Let us examine the way in which each method is used, beginning with the anti-submarine patrol. This is flown for a fixed number of hours over a certain area. The aircraft engaged upon it sweep the seas in order to cover the area as closely as possible. The extent in distance and time of the patrol is regulated by the state of the weather, the number of hours of daylight and the range of the aircraft. The area to be patrolled is an expanse of sea, and is marked on a chart. The whole essence of the problem is that the navigator must find this area; having done so he must keep the aircraft within its limits and he must then bring it back to base.

Before taking off the crews are briefed.



Lashed by a hail of fire, a U-bo

The briefing is not the elaborate lecture or series of lectures which it may be in the case of an operation by Bomber Command. The navigator already knows the limits of the various patrols laid on from the station. He is told which patrol will be flown. The duration of the patrol is then fixed, but it is not laid down in a hard and fast manner. The number of times the area can be flown round and over in the conditions prevailing is stated by the Controller, and it is left to the captain to complete these circuits and to carry on for a further



flounders away from its attacker. It was severely damaged by the Sunderland which caught it in the Bay of Biscay.

period if possible up to what is known as the P.L.E. (Prudent Limit of Endurance). A margin must always be left to cover possible attacks on U-boats or combats with enemy aircraft. These cause petrol consumption to rise sharply, for the patrolling aircraft may have to increase speed and fly a long way off the course of the patrol.

Then a word is said on the procedure to be followed when attacking a U-boat. What it is and how it is performed must remain a secret. All that can be said is that each move-

ment of it is designed to produce the ideal combination in any form of attack—speed and accuracy. The circumstances in which submarines are to be allowed to pass on their way unmolested are then explained. The great importance of taking photographs of an attack and its aftermath is emphasised. Such pictures, including any taken of bubbles or patches of oil, may be of very great value to the Intelligence Officers of the Command. The place of an attack is marked by seamarkers, which are flares dropped on the

surface of the water. The aircraft will then report the result of the attack.

The gear carried by the crews includes, among other things, charts, pictures of surface vessels, silhouettes and photographs of German and Italian submarines and aircraft, descriptions of suspect vessels, and a list of aerodromes to which the aircraft may be diverted if the weather is too bad over its base to make a landing possible. From this it will be realised that the crews of Coastal Command take much of the Station Intelligence Room with them in their aircraft.

The duration of the patrol is governed by the weather conditions and the endurance of the aircraft. During it a log is kept by the navigator recording everything seen, any incident or alteration of course, and other matters worthy of note.

Back at base the crews are at once interrogated, the questions being based on a standard form. They report what surface craft they have seen, the state of the weather and of the sea. If a U-boat has been sighted and attacked the interrogation is searching and severe.

Very great care is taken to collect the evidence and then to sift and weigh it. It is recorded in the form of a special questionnaire which in some Groups is supplemented by what is called an "Inquest" Form.

Even with all this care, however, the assessment of the results achieved by an attack on a U-boat is exceedingly difficult. Accuracy is, indeed, almost impossible except on those occasions when survivors are recovered. The attack is so swift and the results, if any, so prompt that the surface of the sea has closed like a curtain too swiftly for them to be accurately perceived and recorded. This must inevitably be so. Though great patches of oil have stained the sea, though bubbles have formed and burst upon it, the U-boat may not be stricken to death. It may still be able to limp back to one of the numerous bases at its disposal for a refuge between the North of Norway and the South-West of France. On the other hand, it is equally possible that the opposite may have occurred and that the bombs or depth charges, of which only the explosion and the disturbance of the water

Briefing for an anti-submarine patrol is less elaborate and detailed than for a bomber raid. The captain must use his judgment in carrying out circuits over the allotted area up to the "prudent limit of endurance."



caused by it are seen, may have accomplished their purpose and that the U-boat went down on the long slant to destruction, manned by a crew of choked and drowning men.

The cross-over patrol system was established and flown shortly before the war. Its length has gradually been extended both in distance and in time as more powerful aircraft have become available. An examination of the figures for the number of hours flown shows a steady if fluctuating increase over the first twenty-six months of war. The number and length of the patrols are naturally higher in summer, when the hours of daylight are more numerous and the weather conditions more stable. In July 1940, for example, the number of hours flown by our flying boats on patrol was almost trebled.

Though U-boats have frequently been sighted and attacked, the work more often than not is of great monotony. To keep an unblinking and vigilant look-out from the turrets and sidewindows of a Sunderland or from the blisters of a Catalina flying over what seems an illimitable stretch of sea demands physical and mental endurance of a high order. Sometimes a fishing vessel, British, Spanish, French, Norwegian, Icelandic, is seen; sometimes a raft, more rarely a periscope with a spume of foam about it. When that is sighted or when the submarine is seen on the surface, the klaxon sounds and the crew get ready for immediate action. Both bombs and depth charges are used to destroy the enemy.

" A Sunderland attacked an enemy submarine in a position 285° Cape Finisterre 210 miles. Bombs were dropped within twenty feet when the submarine was at periscope depth and a large oil patch with air bubbles was observed. Later more bubbles appeared in the centre of the patch. After twenty minutes the oil patch extended with bubbles continuing to rise. The aircraft remained in the vicinity for three and a half hours." . . . "Two 100-lb. highexplosive bombs were dropped which fell a few yards from the periscope. It is considered that the submarine was hit. Two large brown patches and a pale blue patch appeared on the surface about seven minutes afterwards."... "One Sunderland reported attacking an enemy submarine U.26 in a position 240 Bishop's Rock 204 miles, forcing the enemy submarine to the surface. . . . Bombs were dropped, one of which obtained a direct hit on the stern, causing the submarine to sink. Forty-one survivors were being picked up by a naval unit when the aircraft left." . . . "A Lerwick on convoy escort attacked an enemy submarine and claims a direct hit on the conning-tower. Oil and air bubbles were seen after the attack."

Passages such as these are to be found in plenty in the reports prepared by the Air Ministry War Room.

Little can be said of the second method—the use of sweeps over chosen stretches of ocean by one or more aircraft. The manner in which this method is used and the organisation required must still remain a secret. A single positive result, one out of many, may be described in detail.

The following attack ended in an event at present unique in this war. On 27th August, 1941, a Hudson patrolling from Iceland sighted "the swirl and wake of a U-boat" about 800 yards ahead. It was then a little after 6.30 a.m. "No actual part of the U-boat was seen," reported the captain, "and vision was very limited owing to rain-squall. Marked position with smoke floats . . . and made a submarine sighting report to base." The Hudson cruised round for a little less than an hour, when it again sighted the submarine, this time on the surface a mile away on the port bow. It attacked, but its depth-charges hung up and the submarine dived. A second sighting report was sent. Three hours passed and then another Hudson from the same squadron appeared, having been sent out on "strike." The submarine-it was U-boat 570-had by this time surfaced again and was seen at once 1,200 yards away to port.

The second Hudson dived upon it and released its depth charges just as the U-boat was starting to submerge. "The U-boat was completely enveloped by the explosions and shortly afterwards submerged completely." Two minutes later it shot to the surface, where it remained while "ten or twelve of its crew wearing yellow life-jackets appeared on the conning-tower and came down on deck." The Hudson dived and fired all its guns in turn when each could be brought to bear as it swept in tight turns round the submarine. "The U-boat crew at once scrambled into the conning-



(1) The target that every Coastal Command crew prays for: a U-boat, stationary on the surface, blowing its tanks.



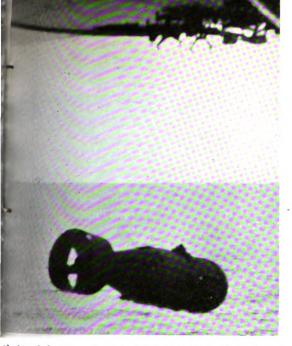
(2) Crash dive. Will the U-boat submerge before the aircraft can manœuvre into the best position for attack?



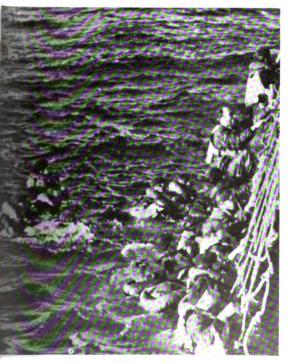
(4) Direct hit! A bomb has burst on the track of an Italian submarine, whose destruction was confirmed.



(5) It is not easy to prove the destruction of a submarine.
Bombs may straddle its track, without destroying it.



(3) Attack! An anti-submarine bomb, released from 50 feet above sea-level, is a weapon of precision.



But sometimes there's no doubt about it. The crew a sunk U-boat swim to the side of a British vessel.

tower and went below." Seven minutes later "a white flag was seen to be waved . . . the crew also brought out what appeared to be a white board and held this up on the deck." The white flag was subsequently found to be the captain's shirt. It was lightly starched and had frills down the front.

The Hudson at once reported to base and asked for surface craft to be sent to take off the crew who had surrendered to it. While awaiting the arrival of a relieving aircraft the Hudson kept the U-boat covered with its guns. Throughout the rest of the day Hudsons and Catalinas took turns in guarding the prize, being over it for about eleven hours and a half. Dusk began to fall and no vessel had yet arrived.

"If it appears surface craft unable to reach position before dark," said an order issued at sunset, "after giving due warning you should sink U-boat." It was found possible, however, to arrange for aircraft to remain in relays over the submarine all night and to keep it in view by dropping flares. Its crew were to be ordered to remain on deck and to show a light throughout the hours of darkness under penalty of destruction if they did not comply. Before this order could be executed a naval trawler arrived in the gathered dusk and sought in heavy seas to take the U-boat in tow. At dawn a destroyer came up and the submarine was eventually brought safely to Iceland escorted all the way by aircraft.

The reason why the U-boat surrendered and the motives of her crew in so doing are not without interest. When she was hit, a rush of water into the hull began to generate chlorine gas. The engine-room crew immediately rushed on deck and refused to go back to their stations. They huddled round the conning-tower and remained there all day and all the following night. It would seem that none of the men had ever before been on an operational sortie.

This captured submarine was almost certainly one of a large concentration discovered in Icelandic waters on 26th August, 1941. To attack them every serviceable aircraft of Coastal Command based in Iceland and the North of Scotland was dispatched in a series of sweeps maintained from first to last light. On 26th August 50 sorties were made, on 27th 34, on



U-boat surrenders to aircraft. 1. After an attack by Hudsons, the submarine surfaced and its crew waved the captain's dress-shirt as a white flag. 2. Naval officers, in a Carley float, take the surrender. 3. A prize crew brings the **U-boat into a British port**.

28th 84, and on 29th 56, a total of 224 in four days. Many attacks were made. One, carried out by a Catalina, well illustrates the fortunes of war. Its pilot saw a U-boat on the surface. He dived towards it, but hardly had he put the nose down when he saw another also on the surface but closer at hand. He diverted his attack to this second U-boat, and as he was delivering it, came under machine-gun fire from his original quarry. He carried on, got into a good position, but when he pressed the button his bombs hung up. Both submarines submerged. On landing at base it was found that the Catalina had been hit by one bullet only. It had severed the electrical connections of the bomb-release gear.

This was but an incident in four days of intensive and successful attacks. The shoal of U-boats was harassed and deprived of all offensive power. Its known losses were considerable, its suspected high. The operations against it showed what Coastal Command can achieve in an area within range of its aircraft by a series of well planned and organised sweeps.





11: The Big Bad Wulf

THE U-BOAT is not the only weapon which the enemy is using in his attempt to blockade this country. There are always the aircraft of the Luftwaffe. Hitherto they have played a large part in his victories. In the Battle of the Atlantic, however, as in the Battle of Britain, they may not prove quite so successful. He.111s, Ju.88s and Focke-Wulf 200s (Kuriers) are the principal aircraft used by the Germans for the purpose of commerce-raiding, though Dorniers have at times taken a hand. It is with the Focke-Wulf Kurier that this chapter is mainly concerned. The other German aircraft which

have played a part in the battle did so mainly in the Bristol Channel and the Irish Sea, where they are still to be met with, though of late in numbers and enterprise much reduced.

The Focke-Wulfs, with their long range which enables them to keep well away from shore-based fighters, prowl far out in the Atlantic. They are the chief threat from the air in the battle. It is probable that at one time they were setting out from Mérignac, the aerodrome of Bordeaux, flying in a wide halfcircle and landing at Stavanger, whence they subsequently repeated the sortie in the opposite direction. The type at present in operation is an all-metal monoplane with a span of a hundred and eight feet and a length of seventyeight. It has four engines; in a "blister" beneath its body there are cannon, machineguns and bombs. It has little armour, and perhaps for this reason is known in the Luftwaffe as the "tinfoil" bomber.

At first these Kondors—to give them the name by which they are usually known, though it applies strictly only to the civil version of the type—were used mainly to attack shipping.

"Suspicious aircraft approaching."

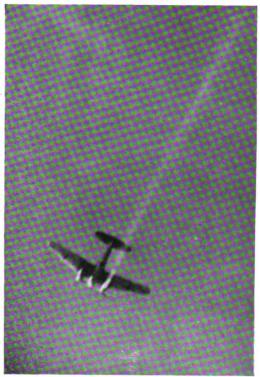


This phase in its intensity lasted somewhat less than six months. The steadily increasing skill with which the gunners of our merchantmen handle their guns, the anti-aircraft fire of the naval escorts to the convoys, the fighters manned by pilots of Fighter Command and of the Fleet Air Arm catapulted from the decks of ships, the patrolling aircraft of Coastal Command have all played their part in forcing the Kondor to adopt a passive rather than an active role.

At the outset the Focke-Wulfs found themselves at an advantage, but as the ships which were the objects of their attack became more heavily armed they were no longer able to face the mounting casualties to their line of battle. They began to abandon attack for reconnaissance. It became, and still is, their practice to try to discover a convoy, shadow it, and send out wireless signals giving its whereabouts so that it may be attacked by any U-boat within range. This co-operation between U-boat and Focke-Wulf first became evident in February 1941.

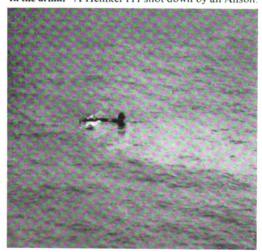
Before then, however, the Kondors had shown considerable enterprise on their own account, for they attacked seventy-eight ships in the first three months of 1940. Their daily activity was the subject of special concern on the part of the Commander-in-Chief, Coastal Command, the Admiralty and the Air Ministry, who took energetic steps to deal with a form of attack which threatened to increase in severity and to achieve striking results. Their efforts were not immediately successful, for 36 ships were attacked in the month of April.

Four days before the opening of that month a very determined duel had been fought between a Sunderland and a Focke-Wulf engaged on bombing a British merchantman. The enemy was first observed five miles away on the starboard quarter flying out of the sun and succeeded in delivering its first attack on the ship before the Sunderland, which, being a flying boat, was considerably slower than the Focke-Wulf, could come up. Two bombs hit the ship and the Kondor then went in to make a second attack while the Sunderland was preparing to engage a Ju.88 which had arrived on the scene. This second German aircraft joined the Kondor and both attacked the ship, but missed. The Sunderland was now within 800 yards of the



A Heinkel 111, port engine on fire, plunges down to destruction after a combat over the Atlantic.

In the drink. A Heinkel 111 shot down by an Anson.





Cannon and machine-gun ammunition for a Coastal Command Beaufighter.

Ju.88, which at once sheered off to port and was not seen again. The Kondor, however, showed more fight and closed head-on in a shallow dive, opening fire with cannon. The Sunderland replied with its front guns and then with its side guns. The result was uncertain, but the Kondor disappeared into the cloud, which was now down to sea-level, and was not seen again.

It was on the 6th May that the first encounter occurred between a Focke-Wulf and a Catalina. A running fight ensued, broken off at frequent intervals as the aircraft lost each other in the clouds. By the skilful use of cloud cover the Catalina twice got within range, on the second occasion silencing the enemy front gunner and scoring a number of hits. The Kondor replied but without much success, most of its fire going well below the Catalina. The German aircraft finally made off at 10.0 in the morning, some three hours after it had first been sighted.

The falling-off in attacks by Focke-Wulf Kuriers on shipping in the Atlantic began in May and continued with slight ups and downs until the end of the year. Altogether 220 attacks, were made during 1941 in the area of the Group mainly concerned with the Battle of the Atlantic. That they diminished as the year went on was largely due to the efforts of this Group. Not only were they attacked by our flying boats far out in the Atlantic, but the shorter range land aircraft played an important part. It was, indeed, not a little due to their efforts that the Focke-Wulfs were compelled to fly much farther afield, or rather "a-sea." To patrol too close to land was to risk a fight.

The story of one encounter between a Hudson and a Focke-Wulf on 23rd July can be told in the words of the Hudson's pilot. The Hudson had just taken leave of a convoy which it had been protecting throughout the morning. The usual farewell signals had been exchanged, when a naval corvette was seen flashing a signal with its lamp. "Suspicious aircraft to starboard," it read. The captain of the Hudson thought that in all probability the corvette had mistaken for an enemy a Wellington of Coastal Command known to be in the neighbourhood. When he himself caught sight of it he made the same error.

"I flew over," he said, "to have a look at her, pulling down my front gun sights just for practice. In fact, I was just remarking to Ernie (the navigator and second pilot) that we were in a lovely position, and that I had the Wellington beautifully in the sights, when he suddenly let out a wild Irish oath—Ernie is from Ulster—and shouted: 'It's a Kondor!'

"Automatically I increased speed and he ran back to man one of the side guns. The wireless operator grabbed another. The rear gunner swung his turret round and trained his twin Brownings. Flying towards the convoy, at about a hundred feet above the sea, was one of the big Focke-Wulf Kondors. We were overhauling him fast. Whether he saw us or not I don't know, but at four hundred yards I opened up with about five bursts from my front guns. I don't think I hit him. He returned the fire at once from his top and bottom guns and I could see his tracer bullets whipping past the nose of the Hudson in little streaks of light. But he missed us and his pilot turned slightly to starboard and ran for it parallel to the course of the convoy.

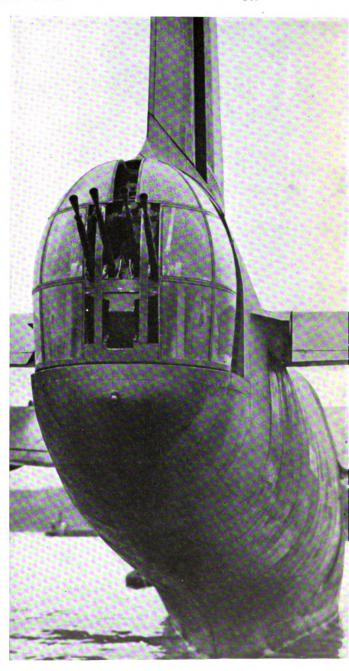
"We had the legs of him all right. We were

overhauling him very fast. Once he put his nose up a trifle, as though meditating a run for the clouds. He must have decided he couldn't make it and was safer where he was, right down on the sea. As we drew closer in my rear gunner opened fire. He was firing forward and I could see his tracer nipping over my wing. Ernie watched it flash straight past him as he waited with his side gun pointing through the window.

"We drew closer and closer. The Kondor began to look like the side of a house. At the end all I could see of it was part of the fuselage and two whacking big engines. My rear gunner was pumping bullets into him all the time. When we were separated by only forty feet I could see two of his engines beginning to glow. I throttled back a bit so as not to overshoot him or, what was more likely, crash into him. For one short moment Ernie saw a white face appear at one of the windows in the Kondor's side. Then it disappeared.

"Just then the Kondor began to turn away. His belly was exposed to us and Ernie opened fire with the side gun, the rear gunner keeping up his stream of bullets all the time. There was a wisp of smoke, a sudden belching of smoke, and then flames shot out from beneath his two port engines. He turned away to starboard and I made a tight turn to port ready to come round at him again. I remember vividly thinking that I must keep up, we were so close to the sea. We came out of the turn and I could see the Kondor again flying steadily away, seemingly unhurt. I was wild with disappointment. I thought he had got away with it. Then I saw he was getting lower and lower and next minute he hit the sea. I found myself yelling: 'We've got him! He's in the sea. Ernie, we've got him!' The gunner was velling down the inter-com, too, great, strange, exultant Yorkshire oaths.

"It was only then that we realised how hard and how silently we had all been concentrating, and how full the Hudson was of cordite fumes, and how short of petrol we were getting. We flew over the Kondor—its wing-tips were just awash—and Ernie photographed him. Four of the crew were in the water, hanging on to their rubber dinghy, which was just inflating. A fifth man was scrambling along the fuselage. We learnt afterwards that a Met, man who had



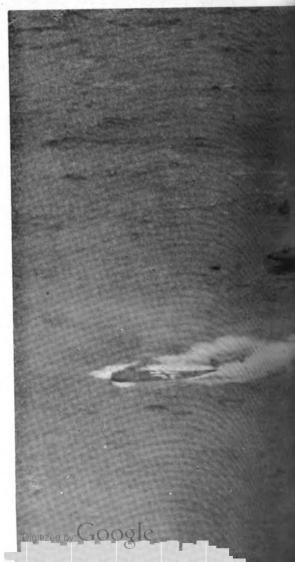
There's a powerful sting in the tail of a Sunderland.



"We flew over the Kondor—its wing-tips were just awash—and Ernie photographed him. Four of the crew were in the water, two hanging on to their rubber dinghy, which was just inflating."

been aboard was shot through the heart. The others were all right. Two corvettes were rushing to pick them up and the whole crew seemed to be crowded on the deck of the leading one, waving and shouting to us. One man was waving his shirt. Another was in pyjamas. Our relief Hudson and the Wellington on U-boat search were circling round too, and as we made off for home we could see the white puffs of steam as all the ships in convoy sounded their sirens."

The capacity of the Focke-Wulf to do harm is



being reduced still further as more American four-engined Liberators come into service. These aircraft can compete on more than equal terms with the Kondor. They are heavily armed and can remain in the air up to twenty hours. A sortie made by one of them in October gives some indication of their possibilities.

The Liberator took off at 5.0 a.m. and met the convoy it was detailed to protect at 8.30. It carried out its patrol until 1.0 p.m., when a signal from the convoy's Commodore sent it to investigate a suspicious aircraft seven miles astern. It was a Kondor, and what is probably the first duel between two four-engined land aircraft took place. It lasted ten minutes. It was indecisive, the Kondor eventually turning sharply and crossing two hundred feet above the Liberator to disappear into cloud.

Some time later another Kondor, or possibly the first, was seen, but before the Liberator could get within range it, too, had sought the refuge of cloud cover. The Liberator went in pursuit, when the captain spotted a submarine on the surface three miles away on the port bow. He



abandoned the now invisible Kondor, dived from a height of 1,200 feet to 50 feet and dropped a stick of depth charges. There were three explosions throwing up huge columns of water and then, after a short interval, a fourth explosion underneath the surface.

"The sea shook and began to boil. A dark centre appeared and rings went out from it." The crew of the Liberator had hopes that they had caused the U-boat some hurt. On landing at base they discovered that only three of the four depth charges released had fallen. One had hung up. There had, however, been four explosions. A blade of one of the propellers was perforated, but this, too, was not discovered until after the Liberator had landed, no difference in the performance of the engines or propeller having been noticed during the flight.

The menace of the Focke-Wulf, though not eliminated, has been greatly reduced. Sunderlands, Catalinas and Hudsons, all of them far slower aircraft, have again and again gone into the attack without pause or thought of the odds. They are still doing so whenever they encounter the enemy and he stays to fight. "Who's afraid of the big bad Wulf" is inscribed on the walls of many of the Stations from which they set out. Their deeds supply the answer.

Some account of the Battle of the Atlantic has now been given. It is, of necessity, incomplete, for the end is not yet, nor in all probability will it be reached so long as fighting between ourselves and Germany continues. To speak, therefore, of a decision would be wrong, for none has as yet been achieved. From the beginning the Germans have been loud and lavish in their claims. On 28th January, 1941, Grand Admiral Raeder felt able to announce to the dockyard workers of Germany that the last traces of imports into Great Britain " are being dealt with everywhere in the Atlantic, in the Indian Ocean and in the Pacific." He went on to assure them that since the beginning of the war 6,300,000 tons of Allied merchant shipping had been sunk.

On 24th February, 1941, the Admiral's chief took up the tale. Hitler informed the Party in its Munich Beer Cellar that "the struggle by sea is only now beginning. . . . In the last two days surface vessels and U-boats have sunk 215,000 tons. 190,000 were sunk by

U-boats, 125,000 yesterday, in one convoy." A month later Deutschlandsender struck a more poetical note. "The wolf pack of the ocean," it said, "has got hold of another strongly protected convoy off the African coast. 77,000 tons of shipping were lost." During October 1941, according to the Donau wireless news, "the German Air Force sank 168,000 tons of British shipping in the waters around England." It was left to Radio Paris to complete the picture of our doom. "U-boats," it proclaimed on 15th November, 1941, "have been so successful in hunting British convoys that they find themselves rather idle."

It is, of course, possible that these and other claims have been made in good faith and that the German High Command when adding up the figures really believe what the U-boat and Focke-Wulf captains—those of them, that is, who return—tell them. It is also possible that they find it advisable to give the German public heartening news from time to time. Or perhaps they are adopting a more subtle plan and seek, by vaunting the prowess of the German Navy and Air Force, to provoke our own High Command into publishing the facts.

It is best, perhaps, to judge these claims by comparing them with those made concerning the losses inflicted on His Majesty's ships and vessels since the outbreak of war. If the Germans are correct they have sunk most of the Royal Navy more than once, and it is now keeping the seas with minus 29 capital ships and minus 13 aircraft carriers, escorted by minus 96 cruisers and minus 2 destroyers. The enemy's tale of our losses during the Battle of Britain may also be usefully remembered. Göring and Goebbels then boasted that 2,380 British aircraft were destroyed in combat alone in the space of 78 days. During that time we did, in fact, lose 758 aircraft. It is idle to follow the enemy into these realms of fancy. The ordinary citizen of this country has a very shrewd idea of the truth, for he can base his opinion on the circumstances of his own daily life, and that is enough for him.

Official secrecy, which has to be imposed in order to prevent the enemy from learning what he would much like to know, is not the only veil spread over this battle. There is a more tangible shroud—the surface of the sea itself.



Only the enemy can know the number of his submarines compelled to submerge because an aircraft of Coastal Command is quartering the sky overhead, and the number of hours thus spent in cruising at a speed only twenty-five per cent. of what it might have been. Even this knowledge cannot be complete and perfect, for not every U-boat that sets out returns. How many knots of speed they have lost, how many miles of sea they have failed to traverse, how many meetings with others of their kind have not been held at the scheduled hour and place must be a matter of constant speculation for Admiral Raeder and his staff.

It would, however, be a grave mistake to suppose that the Allies have as yet won the battle. To do so would be completely to misjudge the nature of the conflict. Such a struggle as this, carried on as it is over so vast an area, can have no rapid, no easy conclusion. Neither success nor failure has so far crowned our arms. The fight sways to and fro. The red line on the graphs recording the sinkings of merchant vessels, pinned to the walls of secret rooms in the Headquarters of the Naval or Air Commanders, rises and falls. One

L

month it may move upwards, the next downwards. The variations are often sharp; rarely does it run level.

On both sides of the Atlantic there are gathered millions who realise what is at stake and who wait, as once an Athenian army waited by the harbour of Syracuse, the issue of a mortal conflict. Unlike the troops of Nikias they are not passive spectators. They have it in their power to exercise a decisive influence on the combat, for they are at work producing the weapons of war and the ships which must carry them to the field. If victory is to be won they must identify themselves with the effort to achieve it.

The battle by air and sea is relentless and there is no pause. It is being fought by the Royal Navy, the Royal Canadian Navy, the Merchant Navy, the Royal Air Force and the Royal Canadian Air Force, to whom the puissant aid of the sea and air forces of America has of late been extended. In the air the brunt is being borne by Coastal Command. Nowhere better than over the Atlantic is its unofficial motto "We Search and Strike" more exactly followed.

Death of a Dornier. Yet another enemy is written off in the dour struggle between Coastal Command and the air-sea raiders.

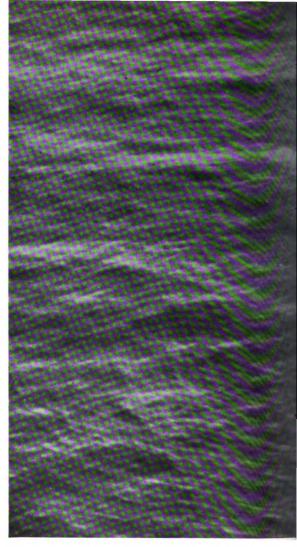


12: Rescue Flights and Secret Missions

THE PROTECTION from the air against the attacks of U-boats and of enemy aircraft given to the ships of the Royal Navy and the Merchant Navy, whether alone or in convoy, is not the only form of aid in the power of Coastal Command to bestow. There is also the assistance to be rendered to a vessel in danger or distress, and to her company if the worst has happened and she has been sunk by the enemy. Since they are able, as a general rule, to see a far greater distance than is possible from the deck or mast-head of a ship, the pilots and crews of Coastal Command are often in a position to give warning should a vessel be running into peril. Being about their business over large areas of ocean almost every day, they are usually at the scene of a disaster more quickly than anyone else. They can also go to the rescue of airmen adrift in dinghies after a forced landing on the sea.

The help which can be given to ships running into danger is best shown by a few examples. On several occasions ships steaming unwittingly into mine-fields have been given timely warning. Thus in March 1940 a number of mines were seen by a patrolling aircraft directly in the path of a Dutch vessel, the "Stadtschiedam." The visual signals made were ignored, but the merchant vessel was eventually induced to make the necessary change of course by bursts of machine-gun fire across her bows.

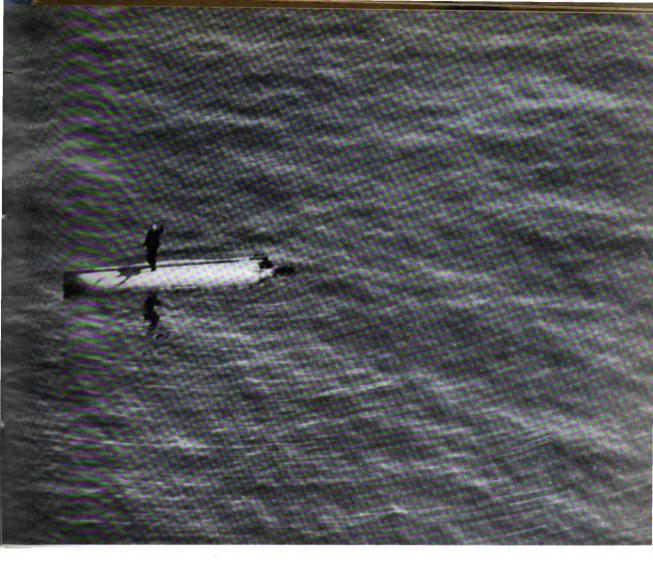
On 16th July of that year a Sunderland saw the masts and upper works of a destroyer and a merchant vessel protruding from thick fog which lay low over the sea off the inhospitable coast of North-East Scotland. The ships, which were making for a port anchorage, were



"One member of the crew survived."

about to run into a small island, but the aircraft, flashing the international sign U-U-U, meaning "You are running into danger," and then the signal "Turn to port," enabled them to enter harbour in safety. Later that day the same Sunderland brought back a destroyer which had lost touch with its six companions.

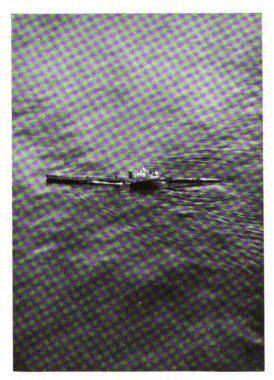
Such shepherding is part of the routine work of convoy protection and needs no further description. Of equal, possibly greater, importance has been the help rendered to the submarines and surface craft of the Royal Navy which have suffered damage by mines or in action with the enemy.



On 27th November, 1939, the British submarine "Triad" reported that she was in difficulties off the Norwegian coast. She was found by three Hudsons sent out for that purpose, and though lost in vile weather, was picked up again by more Hudsons which gave protection to two destroyers and another submarine, the "Triumph," which had gone to her assistance. The "Triumph" herself needed help a month later when she struck a floating mine in the North Sea. On both occasions Hudsons drove off enemy aircraft seeking to bomb the submarines, which reached port in safety. About that time, too, air protection

was given to H.M.S. "Barham" while at sea in a damaged condition.

On the night of 10th/11th May, 1940, the destroyer H.M.S. "Kelly" was torpedoed in the North Sea during an engagement with enemy E-boats. She was part of a force proceeding to Terschelling to engage in operations off the Dutch coast. H.M.S. "Bulldog," which had rammed and sunk one of the E-boats, took her in tow. Air protection was requested and Hudsons found the disabled destroyer. By 6.0 a.m. the "Kelly" had listed so badly that her starboard decks were awash. Nevertheless she was not abandoned by her crew.



The Free French submarine "Rubis," in grave difficulties in an enemy minefield off Norway, was escorted to her base by aircraft of Coastal Command.

All that day Hudsons kept the guard of the skies in relays above her, leaving only when darkness fell. On the next day a Sunderland arrived at dawn and carried out an antisubmarine patrol. Admiralty tugs came up and took over the task of towing the "Kelly," and Hudsons once more gave protection throughout the day. Twice Heinkels tried to bomb the destroyer. The Hudsons failed to prevent them from dropping their bombs, but their presence forced the Heinkels to attack in a hurried, almost a furtive, manner and no bomb fell near their target. Throughout that day and half the next the air cover was maintained until the "Kelly" entered port, little more than her upper works being visible. The Royal Navy had saved their ship; the Royal Air Force had helped them to do so. That evening the Commander-in-Chief at Rosyth expressed his thanks. Forty-nine aircraft took part in this operation, which was completed by 1.0 p.m. on 13th May.

In July 1940 an aircraft of Coastal Command discovered H.M.S. "Whirlwind" which had been badly damaged by a U-boat. It directed another destroyer to the scene and the crew were rescued. On 1st September of that year assistance was given to H.M.S. "Ivanhoe" and H.M.S. "Express."

Nearly a year later, on 22nd August, 1941, the Free French submarine "Rubis" was in grave difficulty off the coast of Norway. Blenheims of Coastal Command found her in the morning and constant patrols were maintained over her. On the next day she was seen to be stopped and reported by signal to a Beaufort that her batteries were destroyed but that she was water-tight. A Sunderland and two Catalinas were despatched to pick up the crew, for it was impossible for surface vessels to reach the "Rubis" with safety owing to the presence of an enemy mine-field. Such a rescue was not, however, necessary, for the "Rubis" succeeded in starting her surface engines and moving slowly towards her base. She eventually made port in safety escorted by units of the Royal Navy, protection from the air being maintained by Blenheims and Beaufighters.

By then the method of rescuing a ship's crew by flying boat was nothing new. It had first been successfully practised by three Sunderlands which went to the rescue of the S.S. "Kensington Court" on 18th September, 1939. The position of the sinking ship had been accurately given and the three aircraft converged upon her almost simultaneously. It was arranged that one should remain on guard above, keeping watch for the U-boat which had torpedoed the S.S. "Kensington Court," while the others landed to pick up the survivors. Of these there were 34 in two ships' boats, but the heavy swell prevented them from approaching the Sunderlands too closely. A shuttle service of rubber dinghies was established and all the survivors were got on board, 21 on the one and the remaining 13 on the other.

In the case of the "Kensington Court" the crew had only just taken to the boats. In that of the "Stangrant" they had been in them for three and a half days. It was on 16th

October, 1940, that the rescue was made. Two days before, a lifeboat with 21 men in it had been seen by a Sunderland, which dropped a container with food and cigarettes, for the condition of the sea made it impossible for the flying boat to alight. Two days later the Sunderland set out again.

"It was still dark," said the pilot, "when one of my gunners reported a red light on the sea some miles away. . . . Soon we could see the outline of a boat below us. We flew round for about a quarter of an hour waiting for daylight. . . . I discussed landing with my co-pilots. We decided that it could be done and I came down on what appeared to be the flattest area of sea in the neighbourhood." The flying boat landed safely, reached the boat, and took off the men. On the way back they were given a hot breakfast on board the Sunderland.

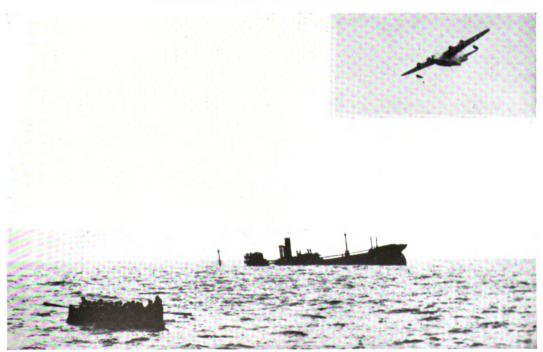
Some five weeks before this rescue a British submarine had held up the Norwegian vessel "Tropic Sea." On board was a German prize

crew seeking to take the vessel into a French port. On the appearance of the British submarine the "Tropic Sea" was scuttled, the Norwegian crew escaping in one boat and the German prize crew in another. A Sunderland with an armed crew was dispatched to pick up both the Norwegians and the Germans. They found only the Norwegians, whom they rescued.

Such air-borne rescues as these, however, form but a small proportion of the total which have been carried out through the instrumentality of Coastal Command. The crews of its aircraft are in a unique position to witness the triumphs and tragedies of the Battle of the Atlantic. Mute evidence of this long, enduring struggle—rafts, Carley floats, lifeboats, empty or manned only by the dead—drifts only too often beneath their eyes. It is when they are occupied that no time must be lost.

Coastal Command began early. In September 1939 the S.S. "Blairlogie," under fire from a U-boat, sent out an S O S. A Sunderland went

The S.S. "Kensington Court" sinking. Her crew were rescued by two Sunderlands which came down on the water, while a third circled above on guard.



to the rescue. Four and a half hours after leaving base and some 300 miles from the nearest land, the Sunderland found not the ship, which had sunk, but the crew in the boats. The aircraft brought an American vessel to the scene and stood by until the rescue had been made, returning late in the evening after a flight of more than 1,300 miles.

On 2nd December, 1939, a Hudson sighted seven people adrift on a raft over a hundred miles from the East coast of Scotland. In fog and mist it guided a Danish ship to the spot. A little later a Hudson found six survivors of the Swedish ship "Listor" clinging to its cargo, a quantity of timber, strewn over the surface of the sea. The Hudson, and subsequently its relief, remained above them for five hours until a destroyer arrived to pick them up.

On 2nd March the S.S. "Domala" was bombed and set on fire 14 miles off Selsey Bill in the Channel. A destroyer was led by an Anson to a raft, the only one of four with anyone on it. On 2nd July a Sunderland was dispatched to find the survivors of the "Arandora Star." torpedoed in the Atlantic when carrying a large number of enemy aliens for internment in Canada. Thirteen lifeboats packed with survivors were picked up soon after 11.0 a.m. Near by them, scattered over a wide area, were rafts, pieces of wood and other wreckage to which survivors were clinging. "Of these there were many score," reported the Sunderland, which dropped "Mae Wests," first-aid outfits and packages of food. Two hours later it found the destroyer "St. Laurent," of the Royal Canadian Navy, and brought it towards the lifeboats. The Sunderland then flew round and round for somewhat more than three hours guiding the destroyer's boats by means of flares to where the survivors were floating.

On 25th September, 1940, a Sunderland on escort duty was proceeding to base after carrying out an anti-submarine patrol round a convoy. After some time its crew sighted a lifeboat in the sea. Flying lower, the captain saw that some of the persons on board were children. One of them, a small boy, began slowly to wave a white rag, spelling out the letters "City of —." The captain knew the rest. This was a lifeboat of the "City of Benares," a liner

which had been torpedoed eight days before. It had been carrying children from this country to Canada. The Sunderland turned back towards the convoy which it had left, signalled to its relief, another Sunderland, and then, petrol being low, returned to base. The other Sunderland flew 50 miles to a warship and led it to the boat. Forty-six survivors were picked up.

A month later a Stranraer flying boat found a lifeboat with 25 survivors of the S.S. "Pacific Ranger" on board. Nineteen of them were rescued by a destroyer. On 26th October a Sunderland helped naval units to pick up survivors from the "Empress of Britain." During the operation three Blenheim fighters gave protection from enemy air attack. A similar office was performed by a Sunderland a few days later when all the survivors from the "Laurentic" were picked up.

In March 1941 a Whitley found survivors of the S.S. "Beaverbrae," the victim of an enemy aircraft. On 10th June two Wellingtons



Mute evidence of this long, enduring struggle.

Sometimes

of the Command each sighted a lifeboat with survivors off the coast of Northern Ireland. Over 40 men were saved by destroyers.

On 10th February, 1942, a Hudson sighted a raft with two survivors upon it. A trawler was directed to the spot and reached the raft on the next day, having been helped thither by a Catalina. The men were rescued. They were a Dane and a Swede, survivors from the S.S. "Yngarin," which had been torpedoed nearly a month before. The men were fit and well when picked up owing to the construction of the raft, a product of the ship's carpenter. It could float either way up and was well stocked with water, provisions and blankets. The men had been able to cook hot meals on it.

So this work goes on. It will end only when the war ends. About 3,000 persons adrift in the sea were sighted and helped by aircraft of Coastal Command in the first two years of war.

On 22nd June, 1941, Hitler launched his

attack on Russia. On the 24th two Catalinas arrived at a base in North-East Scotland and took on board an official Mission to the Government of the U.S.S.R. It included some high officers of the Army and the Royal Air Force, the British Ambassador to the Soviet Government and other important persons. The next day the two flying boats flew to Archangel. One of the passengers kept a diary in which he has recorded, in the manner of Mr. Jingle, his impressions of this long flight of over eighteen hours.

"For the most part out of sight of land. Never dark. Bright morning mist and fog on the sea. One scare—saw aircraft coming near us. Turned out to be other Catalina.

... Became colder, overcast and raining. Difficult to avoid icing.

... Catalina very cramped after normal passenger land plane, extra space being taken up by numerous apparatus, radio, machine-guns, rubber dinghy, sculls.

... Sat for some time on rubber dinghy. At least elastic.

Navigation most accurate,





only an upturned boat remains to tell the story. Sometimes the boat is packed with survivors, who wave to the aircraft.

as sun obscured after early morning. . . . Saw nothing all day, neither ships, birds, nor land, until about 4.15 p.m., when large patches of disintegrating, dirty, grey-green ice-floes showed we were leaving Gulf Stream and Barents Sea for White Sea. . . . Passed occasional islands. Flat, deserted, covered moss and seaweed. No apparent life, even birds. Very dreary. . . . Came down in subsidiary channel near an aerodrome. Difficulty in making buoy. Four shots. Much bad language. . . . Throughout . the flight crew on duty. Worked very hard. Produced minute electric grid. Fried egg and bacon breakfast. Tinned soup and meat and vegetable ration and pineapple slice lunch, all under difficult circumstances. . . . After landing taken to moored river steamer. Ceremonial dinner. Good speech by General."

This flight was one of many trips which aircraft of Coastal Command have carried out during this war in order to take Government servants of all kinds to places all over the world. Such a ferry service became of special

importance during and after the collapse of France. On 18th June, 1940, for example, a Sunderland took the First Lord of the Admiralty and the First Sea Lord to Bordeaux and brought the First Sea Lord back on the next day. Some days later General Sikorski was taken to this country in a Hudson.

On 25th of that month, another Sunderland carried the Minister of Information and General Lord Gort, V.C., on a mission to Rabat. They were commissioned by His Majesty's Government to go to French Morocco, where several French statesmen, personal friends of Mr. Duff Cooper, were reported to have arrived, in order to discuss the new situation with them and with the local British representatives and to discover what were the prospects of continued resistance in French North Africa. The flying boat took off about 9.0 o'clock in the morning and reached Rabat at 7.0 that evening. The landing was made in difficult circumstances, for the river on which the Sunderland had to alight was not

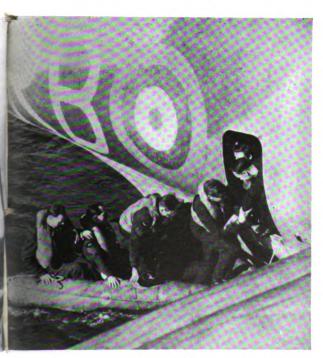




Sometimes the airman can lead a ship to their rescue, and the survivors are brought safely to port.

more than 150 feet wide. Immediately on touching down the pilot had to use his rudder in order to round a bend of the river. A number of French Air Force officers took the pilot and his passenger to the Customs wharf, whence they went to the British Consulate. Here the pilot quitted the party and returned to the flying boat, where he encountered the Harbour Master, who informed him that he must shift it upstream lest it should be in the way of incoming shipping. This was done, and shortly afterwards a secret signal was received for Lord Gort by the wireless operator. The pilot attempted to go ashore with it in one of the dinghies, but a police boat refused to allow him to do so. The pilot, however, was determined to get the message through and made another attempt, which was once more frustrated by the police in their boat.

More desperate measures were necessary. By now it was dark. The captain of the flying boat ordered all lights to be switched on. This would break the strict black-out regulations

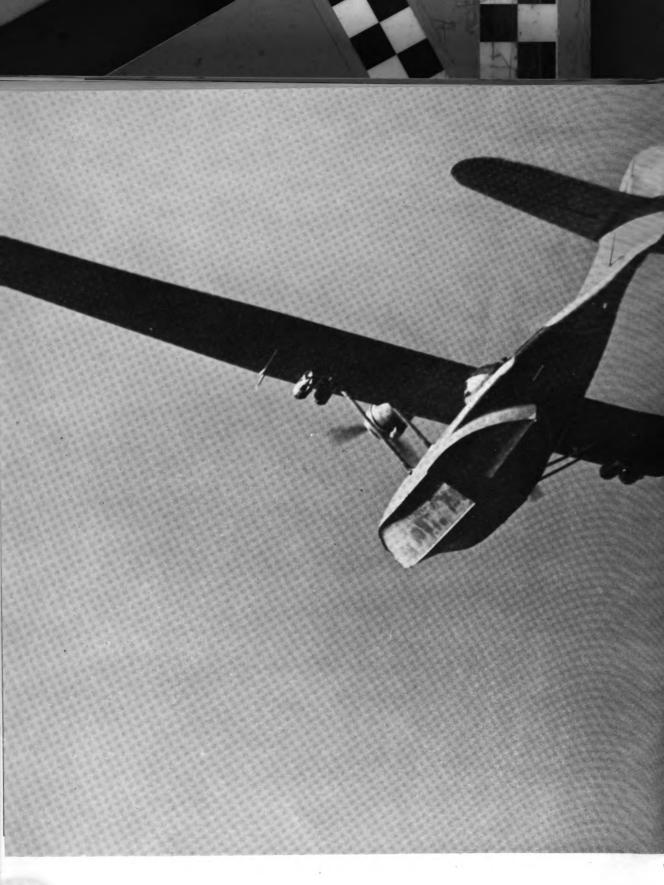


Sometimes it is his own comrades he saves from the sea.

and would, as he knew, bring the police boat quickly to the scene. It did. On drawing alongside, the pilot and second pilot of the Sunderland jumped on board and forced the police, under the menace of their revolvers, to put them ashore. Protesting, they did so, but stated firmly that the flying boat would be placed under armed guard unless the British officers returned to it immediately. The pilots then tried a ruse. The captain of the flying boat explained in broken French that his companion, the second pilot, was in reality the captain and that he himself had only come ashore in order to obtain provisions for the crew. The French police were duly deceived and, thinking that they held the man in command, allowed the real captain to go into the town. With a Consular official he went to the British Consulate and subsequently to the hotel to which Lord Gort had been taken. The message was delivered. A few hours later the whole party returned to the flying boat and for the rest of the night the crew remained on watch beside their guns. The Sunderland took off just before dawn and landed its passengers safely at Gibraltar, going thence to England.

Sometimes more pleasant adventures befall those of the Command engaged on this work. While waiting at Archangel to pick up passengers for London, two members of a Catalina crew went shopping. In a large store one of them saw a number of guitars. He bought one and tuned it to the mouth-organ of his companion. They began to play English tunes and sing English songs. Our Russian allies could not compass the words of these, but the melodies were soon upon their lips, and in the store and presently in the street outside "everyone suddenly burst out singing."

The story of many of these flights upon which aircraft of Coastal Command are constantly engaged must remain a secret until the war is won. Their importance is, indeed, obvious. Commanders-in-Chief have no longer to rely entirely on cipher telegrams or long-distance wireless telephone conversations. They can meet together in conference and together discuss the many problems of the war face-to-face across a table. Then, when the talk is over, the decisions taken, they can enter a flying boat or a Hudson of the Command and return to their posts at the various seats of war.





THEY SEARCH

AND STRIKE

With mine, bomb and torpedo,

Coastal Command maintains an

unrelenting offensive against the

enemy's shipping along the coasts

of Europe, and thus imposes upon

his land communications an everincreasing strain.

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13: Blockade by Mine and Bomb

WITH A FANFARE of trumpets according to their custom the Germans have more than once announced the startling successes which they claim to be achieving in their efforts to blockade this country. Concerning our counter measures they show greater reticence. Counter measures is the wrong term. From the first hour of the war we have imposed a blockade on Germany which has been successively extended to all the countries which her armies have occupied, and that blockade is complete to the limit of our capacity.

It began in much the same way as that imposed during the war of 1914-1918. A system of contraband control was instituted and applied to all ships bringing cargoes to Europe. Contraband control centres at Falmouth, in the Downs and in the Shetlands were set up and were kept very busy in the early days of the war. To them all ships whose cargoes were not covered by Navicerts or which were suspect were brought in by the Royal Navy. Coastal Command gave all the aid it could. In addition to numbers of German merchants, certain neutral traders, lured by the high profits to be made, sought to run our blockade. Devices used to disguise the ships were many of them ingenious. Danish, Norwegian, and other colours were frequently used, and alterations in the superstructure of the ships were made with intent to deceive.

The pilots of Coastal Command have always received a rigorous training in ship recognition. Silhouettes, photographs and models of every kind of vessel are kept at all stations, and those showing the most likely type to be encountered

on patrol are often carried in the aircraft itself. Pilots photographed, if they could, any ship they saw or made sketches of her main features on a pad held on their knees. If they were at all doubtful about a ship they sent a message in code. This was passed on to the Royal Navy, which brought in the suspect for examination.

As the war progressed, the nature of the blockade changed. Germany has overrun so many more countries, and is using their products to maintain and increase the efficiency of her war machine, that the problem has become more difficult. We have not only to prevent goods and raw materials from entering Europe, we must also deny the enemy, as far as possible, the use of his ill-gotten gains.

Sea-borne traffic in the distribution of goods between European countries was in peace time of very great importance. It is even more so in time of war. The seaports of North-Western Europe have always been the main gateway for the exports and imports to and from the industrial areas of Central Europe and their immediate hinterland. Moreover, for the purpose of internal distribution the coastal trade of Western and Northern Europe was of considerable importance. It supplemented the use -so marked a feature on the Continent-of internal waterways for the transport of heavy goods. Coal, building materials, timber, structural steel, fertilisers, cement and other heavy products commonly travel by internal waterways and by sea in coasting vessels up and down the Western coast of Europe. Both methods of transport must be used if the flow of such products is to be maintained.

Moreover, uninterrupted sea-borne traffic is essential if the Germans are to make the most of their conquest of Norway and their domination of the Baltic. Norway has few industries but much raw material, and it can be made available for the enemy's war machine only if it can be brought to Germany for manufacture. It must travel in ships, and those ships cannot make use only of the comparatively safe Baltic ports, for to do so would place a heavy and perhaps an intolerable burden on internal transport in Germany, which must distribute the imports to their final destination. The ships must continue to put into Rotterdam and the North-West German ports. It is now very dangerous to do so. The economic urge to



"Bomb the enemy's ships wherever they may be found" sums up the offensive policy of Coastal Command. Above, heavy bombs in the racks of a Sunderland. Below, bombing-up is a skilled and delicate process.



use them, however, is as great as the danger.

There is no better evidence of the importance of the port of Rotterdam to Germany, and of the vital part played by the Rhine as a channel for the movement of all that is produced by the heavy industries of the Ruhr, than the assiduity with which the Germans continue to use that port in spite of their losses. Some of the exports of the Baltic countries—such as timber, pulp and paper—are essential for the German-controlled industries of the Western occupied countries and Italy. The enemy would undoubtedly like, as in peace time, to be able to carry these to the seaport nearest to the consuming centre. Now, they go as near as they dare and then have to resort to inland transport.

The Germans have also to grapple with another problem. Their forces garrisoning the conquered countries are spread over a wide area. These troops need not only supplies of food, clothing, ammunition and all the other materials required by a modern army, they are engaged in accumulating large stocks of material for the possible invasion of this country and they are at the same time building fortifications along the whole coast of the Continent against the possibility that we may one day invade. Huge quantities of material for the construction of aerodromes, gun emplacements, air-raid and submarine shelters must be obtained and

brought to the places where they are to be erected. The consumption of cement alone must be enormous. If this were peace time there is no doubt that all these materials would be brought by sea.

The German railways form one of the most efficient administrative machines in the world, and their efforts in this war have been as remarkable in their way as those of the German Army. All the early traffic problems of the war were clearly foreseen and efficiently dealt with, the two most difficult being perhaps the transport of coal to Italy and of oil from Roumania.

But even while they were still dealing with problems they had been able to foresee, it was clear that they were working under strain. One example will suffice. The dispatch of one million tons of coal a month from the Ruhr, the Saar and Silesia to Northern Italy involves a railway traffic movement which would be equivalent to the dispatch of a "Flying Scotsman" from King's Cross to Edinburgh every seven and a half minutes throughout the twenty-four hours of the day.

With the later developments of the Russian campaign, huge problems have arisen that were never foreseen and for which plans were never made. The strain has been tremendously increased and the German railway authorities

Near miss! This picture illustrates two sides of Coastal Command's blockade, for the vessel attacked is a German M-class minesweeper used to sweep enemy waters mined by aircraft of the same Command.



have redoubled their efforts to keep traffic off the rails.

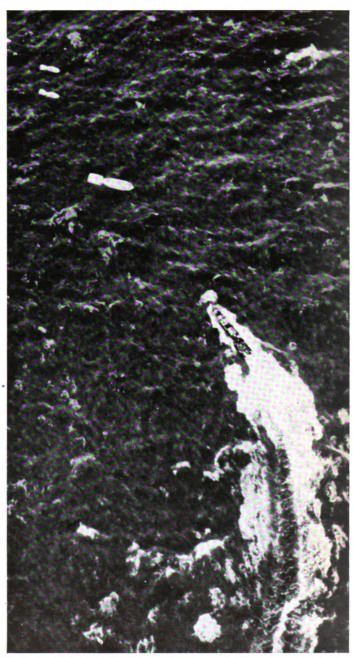
If Germany held the same dominion over the seas as she does over the continent of Europe, the strain on the railways would be so much less severe and her supply problem so much smaller that it would scarcely trouble her at all. No one realises this more than she does, and it is for this reason, and also because many of the garrisons which she must supply cannot be easily reached except by dangerous sea routes, that she is making very great efforts and taking very great risks to use ships with which to relieve the heavy and growing pressure on her railways and other forms of transport. In doing so she has laid herself open to attack, and that attack has been, and is being, carried out with all the vigour at our command.

The part played in this sustained and prolonged assault by aircraft of all three Commands is of very great importance. Coastal Command has concentrated on shipping. It must not be forgotten that, when a ship is sunk, not only are the goods which it carries destroyed, but also that particular means of transport is lost, whereas an attack on a railway may destroy only some of the goods it carries and some of the rolling-stock, which can, moreover, be more easily and quickly replaced than a lost freighter.

Coastal Command makes use of three chief weapons in its operations against enemy shipping—the mine, the bomb, and the torpedo. All three are dropped from the air. Let us take first the attacks by mine.

The task of laying mines in enemy waters is shared with Bomber Command. Each Command has been allotted certain areas along the coasts of the enemy and of the occupied countries off which mines are laid. The aircraft used for the purpose were originally Swordfish, of which the open cockpit added considerably to the discomfort suffered by the crews in winter, though in other respects it was an advantage, for the pilot could see the surface more easily. As soon as Beauforts became available they were pressed into service.

The method used is as follows: The aircraft sets out flying at a height between 1,500 and 2,000 feet. When it approaches near to the place chosen—a shipping channel, the entrance to a port, the mouth of a fjord, or wherever it may be—it comes down low in order to pin-



Fast-moving targets are not easy to hit. A German R-boat takes avoiding action—a sharp turn to port at high speed—as a stick of bombs goes down.



point its position. This is done by picking up some prominent landmark, such as a building, a headland, a lighthouse, a small island. Arrived there, the navigator sights the landmark through the bomb-sight and, at the exact moment at which the Beaufort passes over it, presses a stop-watch, at the same time telling the pilot to fly a course at a certain speed at a certain height for a certain time. During this, the run-up, the aircraft must be kept on an absolutely level keel. At the end of the period, calculated in seconds and fractions of seconds by means of the stop-watch, the observer releases the mine and the operation is over.

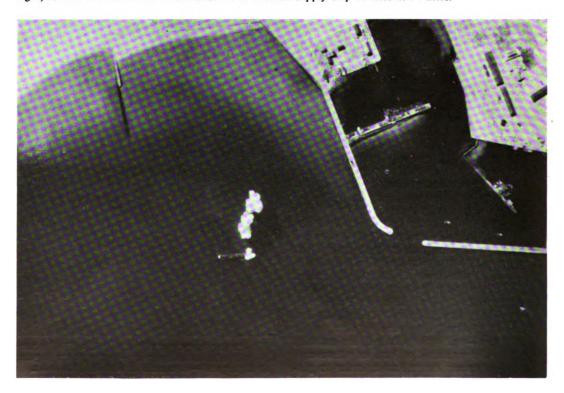
Very rarely do the crew even see the splash when the mine hits the water. The operation is dull, difficult and dangerous. "Creeping like a cat into a crypt" is how one pilot has described it. The Germans do their best to cover all likely landmarks with anti-aircraft fire.

More than once the crews of Coastal Command have seen little lights moving, like strange fireflies, along the edges of cliffs. They came from the pocket-torches held in the hands of German gunners as they ran to man their guns.

Little is heard of these mining operations. Only an occasional reference is made to them in official communiqués. But they go on night after night and the crews who carry them out run risks as great as those who achieve a result by the use of a more spectacular weapon—the bomb or the torpedo. Over a period of six months in 1941 seventy per cent. of the mines laid by Coastal Command were placed in the position chosen for them.

It is impossible to do more than estimate the damage they cause. Intelligence and other sources can never discover the whole truth and it is doubtful whether the enemy himself knows all of it. Certain successes are known to have

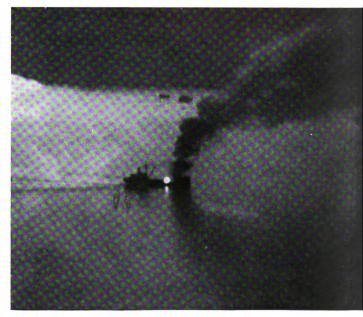
High-level attack. Flying at 8,000 feet above its target, a Hudson, using the Sperry bomb-sight, scored this direct hit on the stern of a German supply ship in northern waters.



been achieved. Here are some instances. In February 1941 a German vessel of about 3,000 tons was damaged near Haugesund and beached to prevent her sinking. A German trawler struck another mine on the same day and sank. The area was closed to traffic for some time. Later that month a German ship was mined off Lorient and many corpses were washed ashore on the Ouiberon Peninsula. An aircraft of Coastal Command had dropped a mine in that area a night or two before. In September of that year two cargo vessels were mined and sunk in the roadsteads of La Pallice and La Rochelle. In October a 4,000-ton ship was mined and sunk in the channel leading to Haugesund and the entrance to the port was blocked for some time.

The more direct method of attack is to bomb the ships of the enemy wherever they may be found. Coastal Command began early. The first enemy ship to be bombed was a tanker attacked by a London flying boat on 10th April, 1940, some forty miles from the Faroe Islands. The limited resources of the Command did not permit it, in those early days, to make attacks on a large scale. Nevertheless. its achievements are not to be ignored. Between 10th April and 31st December, 1940, 223 attacks were made on merchant vessels and supply ships and 81 on enemy ships of war. They took place along the Norwegian coast, the Dutch, Belgian and French coasts, and also in the Heligoland Bight and off the North-West coasts of Germany. The sinking of a merchant vessel off Haugesund by a Hudson on 22nd June and the hitting and sinking of twelve merchant vessels, one of which was of 14,000 tons, and a tanker of 10,000 tons in July must be mentioned.

The attacks in August 1940 were not very successful, but in September two E-boats were sunk by a Blenheim 18 miles off Dieppe on the 10th and hits obtained on ten merchant vessels, one of which was certainly sunk. In October 1940 three merchant vessels were hit. The attacks fell off in November, but in December no less than 45 were made on merchant vessels and one on enemy destroyers. So ended the year 1940. The attacks had been mostly carried out by single aircraft, a Blenheim, a Hudson, or a Beaufort, though sometimes the attackers flew in formation of two or three. They were



"I seek my prey in the waters" is the motto of one Coastal Command squadron. An enemy M.V. blazing after an attack by a Beaufort.

in the nature of an experiment. The crews taking part in them were gaining experience of which they were to make good use in 1941. It was not a quick process. To attack and hit a ship, especially when it is protected by its own fire and that of flak-ships, is not only dangerous but difficult. The technique was worked out and improvements made through that winter and spring.

During this period much work was done to determine the correct fuse-setting of the bombs. It was very necessary to do so. On 30th March an enemy ship loaded with depth charges, probably an anti-submarine vessel, was found off La Rochelle and hit by a 250-lb. bomb dropped from 400 feet without a delay fuse. The bomb detonated all the depth charges and blew the ship to pieces. The aircraft returned "riddled with bits of its target." As a result of this and other attacks of the same kind it has become the general practice to use delayed-action bombs.

When vessels carrying ammunition, however, are hit, the explosion is naturally so formidable

that the aircraft runs a great risk of suffering damage. On one occasion a Hudson belonging to a Dutch Squadron dropped a salvo of bombs on a ship near the Norwegian coast. "Nothing happened at first," reported the Dutch pilot. "The rear gunner started swearing because he didn't see anything. Then he said he saw the crew frantically lowering a boat. Then came a tremendous explosion and we thought our bombs had hung up and gone off underneath our aircraft till we saw the ship in small pieces."

Bomber Command took a prominent part in the attacks on shipping. The work they did has been described in the Air Ministry's account of the activities of that Command. In March 1941 Coastal Command aircraft made nine attacks, and eight in the following month, on enemy ships of war at sea, in addition to a large number of attacks on the "Scharnhorst" and "Gneisenau" in harbour at Brest. They also hit for certain fifteen merchant vessels during the same period, and probably many more. One attack on a convoy of eight merchant vessels off Stavanger on 18th April was pressed home with great determination. Two merchant vessels were hit and left sinking for the loss of two Blenheims: a second attack made on the convoy encountered heavy opposition from Me.110s which shot down three Blenheims after one of them had scored a hit on another vessel.

The attacks continued on much the same scale throughout the summer. On 11th June Blenheims scored seven direct hits on a large tanker discovered between Ostend and Dunkirk. On 5th July Blenheims, again escorted by fighters, discovered an enemy convoy near Zuydcote. Some of the aircraft attacked from a high level and drew the fire of the convoy and its escorting vessels. The remainder went in low and scored two direct hits on one merchant vessel and another on a second. One of the Blenheims, hit by anti-aircraft fire, struck the water, bending both propellers, but got back to base.

By then the Blenheims and Beauforts operating over the English Channel had been so successful that it was practically denied to enemy shipping. After July attention became more concentrated on the Dutch and Norwegian coasts. By the end of that month Continental business men were complaining

of the heavy losses incurred by them in shipping goods from Dutch ports.

The attacks by bombs on enemy shipping reached a momentary climax in October and November 1941. Many of them took place by night during the moon periods, and the aircraft employed were Hudsons flown by British. Canadian and Dutch Naval Air Squadrons. The attack on the night of 29th/30th October is especially noteworthy. Reconnaissance on the morning of the 29th had disclosed a concentration of German shipping in the harbour at Aalesund and the neighbouring fjords. Hudsons set out from the North of Scotland and delivered the attack. The first to arrive saw the ships lying at anchor beneath a brilliant moon lighting the harbour in its frame of mountains on which the first snows of winter had fallen. The attack can best be described in the words of one of those who took part in it:

"There was a lot of flak coming up as I came over the target. I could see one ship burning, with smoke pouring from it. The ground was covered with snow and I had the whole target in silhouette. I flew around pretty low for a bit, then climbed up to get a better view and choose my target, keeping out of range of the flak. I saw a second ship hit and it soon became an inferno of flames. We could actually see the plates red-hot. I saw four other aircraft attack shipping in the harbour. They were flying very low, and the flak was streaming down on them from batteries in the hills—green, white, red, yellow. A lot of it was going straight on to the enemy's ships.

"I had by then chosen my target—the biggest ship in the harbour, about 5,000/6,000 tons. I approached from the North, about five miles away, my engines throttled right back. I came down to about 5,000 feet, by which time I was nearly over the ship, and dived straight on to it. I dropped my bombs at about 2,000 feet. I did my own bomb-aiming. Directly the bombs were gone I pulled up over the town. I was then down to about 1,000 feet, still throttled back; then I opened up fully and went off. There was a lot of flak coming up at us. Some of it came pretty close, but we couldn't actually hear it. The gunner definitely silenced two flak positions.

"I flew right round the harbour and when I





Aalesund, a few hours before the successful raid of 29th/30th October, 1941. Four merchant vessels were sunk and three heavily damaged.

came back to the target I saw the ship was still there. I said to the crew: 'We must have missed it.' A moment later the gunner shouted: 'Think I can see a glow forward.' I turned round to have another look and saw she was down by the bows. I flew round again and this time I saw the bows were awash. I kept on flying round, and next time I looked the water was about up to her funnel. She got lower and lower, then we saw the rudder come out of the water and about a third of her keel. Just before she went down we saw part of the stern with the flag-pole sticking up, and as we watched she sank. The ship took twelve minutes to sink from the time I released the bombs. It was a most satisfying sight to see it going down."

All the aircraft returned safely. One of them was carrying the Air Officer Commanding the Group to which the Squadron making the attack belonged. Its bombs sank one of the four ships destroyed that night. Three others were hit and very heavily damaged.

In the five nights from 31st October to 5th November eighteen merchant vessels were hit, the majority, perhaps all, being sunk or burned out. On 2nd November the attack switched to the Dutch coast and four ships were hit. In less than a month about 150,000 tons of enemy shipping had been sunk or severely damaged, and of this about 120,000 could be claimed by Hudson Squadrons. The denial to the enemy of these ships and the loss of their cargoes undoubtedly affected his military operations against Russia.

To read the reports submitted by pilots immediately after their encounters with enemy ships is to receive the impression of men so eager to get to grips with the enemy that they disregard the risks involved. This, however, is not so. A more careful perusal of them shows that the captain of a Hudson, a Beaufort, or a Blenheim, while prepared to take great risks.



and in fact accepting them as in the ordinary course of duty, is not at the same time heedlessly risking the lives of his crew or the safety of his aircraft.

"From mast height I laid a stick of bombs across the ship. I didn't see them drop, but the rear gunner reported: 'There's one on the deck.'"... "At that moment both my engines spluttered and stopped. That shook me, for we were flying right between the masts."... "The whole sky lit up as two of the bombs burst and the ship seemed to disappear into thin air."

Such phrases as these indicate how closely pressed home is the attack, but they are often followed by the statement that it was made from cloud cover, that evasive action followed immediately afterwards, and that the aircraft regained the shelter of the clouds as soon as possible. Such actions on the part of the

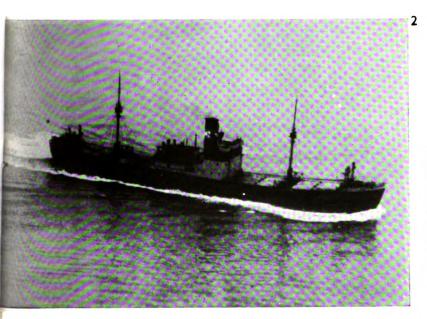
pilot in no way detract from the achievement. On the contrary, they enhance it. The enemy's merchant vessels, of which all are armed and most protected by flak-ships which put up a heavy barrage, are not attacked haphazard. The tactics of swift approach and swift "getaway" have been carefully worked out and studied, and though the hazard of the operation is never allowed to interfere with its execution, if the chances of a successful attack are nil it is not made. If there is even the smallest prospect of success, it is.

Single enemy vessels or vessels in convoy hug the coasts of conquered Europe. They are discovered, therefore, by visual and photographic reconnaissance or by means of patrols given a roving commission to attack any suitable shipping target which may present itself. Such patrols are called "Rovers." They are sent out very often at the discretion of the Officer Commanding the station, who acts under a general order from the Group, and they are flown both by day and night. They were welcomed from the start by the pilots and crews as an exciting change from convoy or anti-submarine patrols.

In daylight, weather is of supreme importance. Crews detailed for such patrols cannot take off unless there is a reasonable certainty that the area they are going to investigate will be covered with cloud.

"There is a feeling of unreality," says a Wing

talking to a pal, or perhaps blowing on cold fingers. . . . The moonlight Rover is quite different and in some ways more fascinating. . . . It can take place only on bright nights. There is something indescribably exhilarating about flying low over the water along a path of living flame. . . . Surprise is nearly always achieved because it is possible to see much more looking up-moon than it is looking the other way, and the marauding aircraft comes suddenly on the ship out of the ghostly murkiness of night."



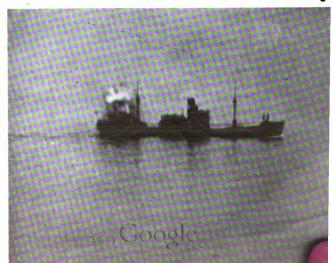
Delayed-action bombs are used in low-level attacks, so that the aircraft shall not be damaged by the explosion.

1. A stick of bombs has been dropped from mast height over the stern of this enemy ship.

2. The ship steams on, apparently unscathed.

3. A second or two later the bomb makes itself felt.

Commander, "in starting out on a bright, sunny day and presently flying into horrible grey weather and so finding the enemy coasts, and flying along low-lying, sandy shores or an island of the Frisian group and perhaps stumbling on a ship before either she or oneself has quite realised what has happened. The whole essence of a successful shipping 'strike' is surprise. . . . The attacking aircraft has to come in very close and very low. . . . It is in this position, however, for only a few seconds, and we rely on catching the gunner on board when he is lighting a surreptitious cigarette,



3

14: Torpedoes Running Strongly

THE SAME CONDITIONS for attack apply to the torpedo-carrying aircraft of the Command. The Squadrons engaged on them fly Beauforts, aircraft which can carry either bombs or torpedoes.

The torpedo is an unhandy weapon when it is carried by an aircraft and launched from the air, but it is more effective than any other against a ship, for it explodes beneath the surface of the water, and the damage that it causes is therefore, in nine cases out of ten, more severe than that caused by a bomb. The torpedo is unhandy for a number of reasons. It is brittle in the sense that if it is dropped from too great a height or when an aircraft is travelling too fast it will break up on striking the surface, and it is hard to aim, for it must enter the water at the correct angle. If it does not it will either hit the bottom and there explode or be diverted, or move up and down as though on a switchback, "porpoising" as it is called, and then break surface. Moreover, its delicacy of construction makes it impossible to drop it if the aircraft is flying too fast. It cannot be dropped too near the target or it may pass beneath it, and this means that the pilot must become very proficient in judging distance.

Pilots and crews go through a course of intensive training in which they learn as much as they can about the idiosyncrasies of the torpedo. By means of simple and ingenious photographic machinery the pilot under instruction who has attacked a target with dummy torpedoes, and the fully trained pilot who has loosed his torpedo against a ship, are enabled to discover the exact distance from the target at which they dropped them. The torpedoes are

beautifully made and covered with anticorrosive paint, which gives them a dark blue colour. This paint is very effective against the action of sea-water, and torpedoes have been known to remain in the sea for as long as thirteen years and still be perfectly serviceable.

The Beauforts operate on cloudy days or, if the weather is clear, with a fighter escort, and during moonlight nights. They, too, find the enemy by means of a Rover patrol or a "strike" directed against a ship or a convoy which has previously been discovered by reconnaissance.

To explain more fully the way in which a torpedo-carrying squadron works here is an account of the start of an operation as seen in the Operations Room of a squadron which has taken a very active part in the onslaught on enemy shipping. The time is the early summer of 1941, when torpedo attacks on enemy shipping were very frequent.

[Telephone rings in Operations Room— Controller, Group Headquarters, wishes to speak to Controller.]

CONTROLLER. Controller Selsey here, sir.

CONTROLLER (GROUP). Controller Group speaking. A "Jim Crow" reports an 8,000-ton tanker, a 3,000-ton merchant vessel, and five escort vessels, course Westerly, speed 6 knots, time 16.30. Six aircraft of X Squadron loaded with torpedoes to rendezvous over Pevensey Bay 17.50 hours. Fighter escort will be provided.

CONTROLLER. Right, sir. I'll bring them to immediate readiness. [Controller replaces telephone and addresses Navigator.]

Strike on for X Squadron. Six aircraft. Lay on and plot course to Beachy Head, thence to Le Tréport. Aircraft are to rendezvous to pick up fighter escort at Pevensey Bay at 17.50 hours. I should allow ten minutes for the aircraft to formate and set course.

[Controller rings Squadron Commander.]

Instructions from Group—six aircraft for immediate strike. Will you please come over for the gen.(1)

[Controller then rings Station Commander and passes information received from Group.]





The torpedo is the airman's most effective weapon against shipping; but its successful use demands extremely delicate judgment of height and distance, as well as the stoutest nerves.

NAVIGATOR (to Controller). Crews to report to Operations Room 16.30 and to be air-borne by 17.30.

[Controller telephones Met. forecaster and asks for weather report.]

[Navigator, having worked out track times and distances, calls to N.C.O.]

Sergeant, issue Form Green to Squadron for this strike and forms to Group, will you?

CONTROLLER (to W.A.A.F. clerk). Inform A.L.O.(2)/Buxted,/C.C.L.O.(3) Fighter, Ops. Steyning, of times of take-off and return of the

six aircraft of X Squadron.

(To A.C.W.(4).) Bring six aircraft under orders on State Panel (5) and bring it up to date. (To Intelligence Officer.) Will you get out the gen?

[The Intelligence Officer prepares his material for briefing and instructs the Photographic Section to fit the necessary cameras.]

[Enter Squadron Commander. To Controller.]

SQUADRON COMMANDER. What's all this about?

(1) Royal Air Force slang for information, (2) Air Liaison Officer. (3) Coastal Command Liaison Officer. (4) Aircraftwoman. (5) The board on which details are given of the exact state of each aircraft and crew of the Squadron.



Swift approach and swift getaway is the secret of a successful "strike." A Beaufort torpedo-bomber dives out of the clouds.

CONTROLLER. One 8,000-ton tanker and one 3,000-ton merchant vessel and five escort vessels steaming at 6 knots on a Westerly course. [Exit Squadron Commander to interview Intelligence Officer.]

CONTROLLER (to Navigator). It's time these chaps were here—time's getting on.

NAVIGATOR (to Controller). Everything has been checked and is ready. Has Group confirmation arrived yet?

W.A.A.F. Just arrived, sir. [Hands to Controller and takes copy to Intelligence Officer.]

[The Station Commander arrives and asks the Controller if everything is correct. The Controller gives more information concerning the strike, about which he has previously given brief particulars over the secret line, and shows the Station Commander confirmation sent from Group to him.]

[The crews arrive at the Operations Room, where they are briefed as follows:]

"An 8,000-ton tanker, a 3,000-ton merchant vessel and five escort vessels have been reported by a 'Jim Crow' to be steaming at 6 knots in a Westerly direction down the French coast off

Le Tréport. The 3,000-tonner is being led by an 'E' or 'R' boat followed by the larger tanker, which has a small escort vessel astern, two more on the seaward side of her and another 'E' or 'R' boat on the landward side. They have a pretty effective screen.

"We will take off from here at 17.30 to give us ample time to get to Pevensey Bay for rendezvous with fighters. Three squadrons of Hurricanes will be giving close escort, and there will be others giving cover above. We will set course from Pevensey Bay at 17.50 for a point 10 miles West of the convoy in view of the report of haze, so that if we hit the coast we can't fail but find them if we turn East. All aircraft will keep low on the water going out.

"As there is only one escort vessel on the port side we will come in and attack from the land. Another advantage of this will be that we'll be more difficult to see coming up on the approach. Just before reaching the target the fighters will go in ahead and keep the escort ships busy. We'll fly in two 'Vic' formations of three aircraft. Robinson, you'll lead the sub-section and position yourself about 100 yards away on my port quarter. On sighting the target I will give you orders to spread out from echelon to port. This will mean that we shall all be able to drop roughly together and cover a wide area, thereby increasing our chance of a hit, and ensuring that avoiding action by the ships will be made more difficult.

"When you see my fellows taking up echelon, put yours in echelon also and open out to about 150 yards intervals. Take individual and violent avoiding action yourselves as you approach to drop, but take care to get a good steady release in spite of the flak, which will probably be plentiful. Don't drop outside 800 yards. After dropping, break away and re-form in tight 'Vic' as soon as possible to starboard.

"We will take the tanker and you should be in a good position for a good shot at the merchant vessel. Take off and form up in the usual manner.

"Wireless operators, stand by cameras throughout attack and take as many photos as possible during turn away. This should be simple with the hatch, on the right side for a change. W/T operators will obtain their instructions from the Signals Officer.

"Navigators will keep an 'Air Plot' in case aircraft are separated and have to return individually."

[The Intelligence Officer then addresses the crews.]

"This tanker is taking oil down to Brest, so I need not stress her importance. The 3,000-ton merchant vessel is a possible raider. Have a good look, because it's very important to identify her. You've all got cameras. Don't forget to use them. Photographs are invaluable.

"You won't be worried by flak from the shore, but there will be plenty of light stuff from the escorts, which are all 'R' boats. They may have a balloon or two, so watch out. The nearest Hun fighters are at Blank, where there is a staffel (an operational unit of the Luftwaffe), but anyway you've got a fighter escort to look after them."

[The Operations Navigator then briefs the aircraft navigators on tracks, times, etc., and gives them any information regarding our own forces and obstructions en route to the target. The Signals Officer then speaks about communications and the Met. Officer about the weather likely to be encountered. The pilots and observers leave. Soon the sound of aircraft taking off is heard.]

We have watched the start of a typical "strike." Let us now look at some of the operations undertaken by torpedo-carrying squadrons of the Command since September 1940. The first attack of importance was made on the night of the 17th, when six Beauforts in two flights of three attacked shipping in Cherbourg harbour. This French base has always been heavily protected since it was occupied by the Germans. At that time it was probably the best defended of all the Channel ports, and these, be it remembered, were then full of enemy shipping collected in preparation for the invasion of this country.

The attack made by the Beauforts was unique, for up to that moment no torpedo had ever been dropped at night in the whole history of warfare. To give the Beaufort torpedocarriers the best chance of success a diversion was arranged by sending over Blenheims, also of the Command, to bomb the target and thus distract the anti-aircraft defences. Led by the

Squadron Commander, the leading flight of Beauforts reached Cherbourg while the bombing attack was in progress. They could see a number of fires and a great quantity of flak.

"I decided," said the Squadron Commander, "that I would enter by the Western entrance of Cherbourg harbour. I took this decision because there was a great deal of wind and I thought that if I were to approach the Germans with the gale in my face they might not hear me. That indeed proved to be the case, because when I entered the harbour no one fired at me. I had hardly got in, flying at about 50 feet, when the Germans opened fire.

"I was so close that I could actually see them and I watched a German gunner, one of a crew of three manning a Bofors gun, trying to depress the barrel, which moved slowly downwards as he turned the handles. He could not get it sufficiently depressed and the flak passed above our heads. It was bright red tracer and most of it hit the fort at the end of the other breakwater on the farther side of the entrance. At the same moment I saw a large ship winking

The Target—an "Altmark"-type tanker, with the shadow of the attacking aircraft below her stern.



with red lights, from which I judged that there were troops on board firing at us with machineguns and rifles.

"I dropped the torpedo in perfect conditions, for I was flying at the right speed and at the right height. Half a second after I had dropped it five searchlights opened up and caught me in their beams. I pulled back the stick and put on a lot of left rudder and cleared out. The trouble about a torpedo attack is that when you have released the torpedo you have to fly on the same course for a short time to make quite sure that it has, in fact, left the aircraft. I remember counting one and two and three and forcing myself not to count too fast. Then we were away."

Another Beaufort coming in immediately afterwards seemed "to be surrounded by coloured lights," and a third, flown by a sergeant pilot, hit a destroyer and at the same time lost half its tail from a well-aimed burst of anti-aircraft fire. It got safely back, however. All the pilots reported that the opposition was the fiercest they had ever experienced. In this gallant affair one Beaufort was lost.

This was a moonlight attack. Soon afterwards, at the beginning of an autumn afternoon, a roving patrol of two Beauforts found two enemy destroyers and six escort vessels off the Dutch coast near Ijmuiden. These they did not attack, but carrying on soon found a 2,000-ton mine-layer surrounded by four flak-ships all at anchor in the harbour. attacked, but the torpedoes were swept from their course by the tide. As one of the Beauforts turned away it was hit and the elevator controls severed. The pilot, however, succeeded in flying his aircraft safely home by juggling with the throttle and elevator trimmer. "Surprisingly enough the elevator had a marked effect on the aircraft's trim despite the fact that the fore and aft controls were severed." reaching base in very bad weather, with clouds down to 50 feet, he was seen to pass over the aerodrome, but he could not turn the aircraft in its crippled condition enough to regain it. He followed the coast and, although the flaps of the Beaufort were out of action, made a successful landing on another aerodrome with most of his crew wounded.

More than one reference has been made to crash-landings in this account. They have to

be made when the undercarriage is unserviceable and the wheels will not, therefore, drop. Here is what happened on a March day in 1941 to a Beaufort which had scored a hit on a destroyer off the Ile de Batz and had been hit by a shell which destroyed the hydraulic system, rendering all the turrets and the undercarriage unserviceable.

"On reaching base," says the account, "the Squadron Leader circled the aerodrome for an hour to consume all his petrol. While doing so his air gunner, a large man, succeeded in climbing out of the turret and into the tail in an effort to staunch the holes in the pipes with rags, but in this he was not successful. The pilot spoke to the ground, saying: 'We will crashland. Keep us some tea.' To crash-land it was necessary to fly the aircraft straight on to the ground, throttle back at the last moment and then cut off the engines. This he did and the aircraft skidded 120 yards along the runway, structure and dust flying up on either side. The starboard propeller shot off and spun along in front of the aircraft on its tips like a wheel. The pilot thought at any moment that it would pierce the perspex windows of the cockpit. 'The funny thing,' he said afterwards, 'about getting out of a crashed aircraft is when you step down. You go straight on to the ground without having to climb down by means of the usual footholds.' "

Much has also been said of the activity of the flak-ships. The Germans are using them in ever-increasing numbers to protect shipping, of which the value, always great, grows daily. Sometimes as many as five have been observed escorting a single merchant vessel. Their crews are not unnaturally light on the trigger. "Just as we were right over the ship it spotted us," reported the pilot of a Hudson who met one such vessel off Norway. "The Germans opened up first with machine-gun fire, then the heavier guns started firing. It seemed to me, at that moment, that they were throwing up everything at us except the ship herself." was bombed and left burning.

The torpedo attacks continued, the majority being carried out during Rover patrols. On 23rd October, 1940, for example, a German convoy off Schiermonnikoog, made up of nine merchant vessels and three flak-ships, was attacked by two Beauforts, the largest vessel



being sunk and the second largest left listing heavily to port. Here again the anti-aircraft fire was intense, but its accuracy poor, possibly because the Beauforts, when retreating after loosing their torpedoes, had the help of a 40-mile-an-hour wind behind their tails. On 8th November three Beauforts attacked a merchant ship off Norderney. All torpedoes missed, but in taking avoiding action the ship ran aground and became a total loss. The next day a torpedo running strong and straight towards a vessel off Borkum hit a sandbank and exploded, doing no harm. The state of the tide had saved the enemy.

During 1941 torpedo attacks increased. They were made not only off the Dutch, Belgian and Danish coasts, but also along the Norwegian coast. On 9th February, for example, three Beauforts attacked six destroyers off Norway and hit two of them. On 2nd March a large merchant vessel was hit off the Danish coast and left on fire. On the 12th an enemy destroyer was blown up in moonlight off the Norwegian coast.

Early in September a fierce action was fought near Stavanger between Beauforts seeking to torpedo a large tanker and Me.109s which came to its rescue. The tanker was hit by two torpedoes, an escort vessel by one, and a Me.109 shot down. One Beaufort was lost. Another which returned safely entered cloud cover only twenty yards ahead of the German fighters. A little later in the month a cargo vessel was set on fire near the Lister Light.

The catalogue of attacks is a long one. A few items in it have been mentioned. There is not space for more. In twelve months 126 attacks by torpedo were made. Between January and September 1941 87,000 tons of enemy shipping were sunk. Two more attacks must be described. On 12th June, 1941, a Blenheim on reconnaissance emerging from clouds some miles South of the Lister Light saw, 1,000 feet below, four or five enemy destroyers screening a much larger vessel, coloured light grey, steaming North-West. The larger vessel was almost certainly the "Lützow," and it seems probable that she had put out with the object of raiding our commerce in the Atlantic. In addition to her destroyer escort, the pocket-battleship had an escort of Me.109 and Me.110 fighters. The Blenheim slipped back into the clouds. It was then one minute before midnight.

On receipt of its message a striking force of Beauforts was sent from a Scottish aerodrome to attack with torpedoes. At 2.20 in the morning of the 13th June—it must be remembered that in those latitudes, at that time of the year, there is almost no darkness—one

"They were throwing up everything at us except the snip herself." A flak-ship (extreme left) firing all her guns at the Beaufort, which has attacked a large enemy motor-vessel.



of the Beauforts attacked the enemy. It flew low, crossed just above one of the protecting destroyers, and released its torpedo at a range of 700 yards. As the aircraft broke away the air gunner and wireless operator both saw a column of water leap from the "Lützow" amidships, and this was followed by a dense cloud of smoke. A few minutes later a second Beaufort arrived on the scene, which the destroyers were busily engaged in obscuring by means of smoke. The second torpedo was fired from 1,000 yards into this artificial haze and almost certainly hit the pocket-battleship. She was picked up again later by Blenheims of Coastal Command, which, together with Beauforts, shadowed her for many hours. By this time she and her escort had turned about and were making for the Skagerrak at reduced speed. The "Lützow" subsequently put into a North-West German base for repairs.

The "Scharnhorst," "Gneisenau" and "Prinz Eugen," it will be remembered, were attacked by aircraft of Coastal Command on 63 occasions in 1941. On 12th February, 1942, they broke out of Brest and, passing through the Channel, reached the safety of their home bases. In their dash to the North Sea and the Heligoland Bight, a manœuvre executed with skill and determination, they had the great advantage of thick weather.

Besides making it impossible for a large number of aircraft of Bomber Command to find and bomb them and forcing those who did to release their bombs from an altitude too low to do them very great hurt, it prevented aircraft of Coastal Command from discovering their departure.

On the night of 11th/12th February the usual patrols over Brest were flown from dusk to dawn. A reconnaissance on the previous afternoon had revealed both battle-cruisers berthed at the torpedo-boat station, protected by anti-torpedo booms, and the "Prinz Eugen" at the coaling wharf. Six destroyers were also in the harbour. Some time during the night, which was pitch black with no moon, they slipped out.

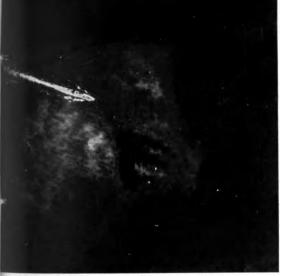
On the morning of the 12th the weather was still thick and nothing was seen. A report received by Headquarters, Coastal Command, at 11.28 stated that a large enemy naval force, including the "Scharnhorst," "Gneisenau"

and "Prinz Eugen," had been sighted between Berck and Le Touquet. A Beaufort, a Whitley and two Beaufighters were at once ordered off to shadow this force, while Hudsons and Beauforts, provided with fighter escort, endeavoured to deliver bombing attacks in the early hours of the afternoon. The weather was so thick that they achieved no result and it proved very difficult for the Hudsons and Beauforts to maintain contact with the fighter escort. Beauforts carrying torpedoes delivered attacks off Holland, which were possibly more successful. One Squadron did so only at its second attempt. At the first the enemy was not found. At least three torpedoes were observed to be running strongly towards the targets and one crew reported that they had seen an enemy warship listing badly with smoke pouring from her bows. The Beauforts were subjected to very fierce anti-aircraft fire and to severe fighter opposition.

Most of them found the enemy by the simple process of running into heavy flak fired by unseen ships. One made three attempts to attack, but was by that time so badly damaged that its torpedo could not be released. saw my leader waggle his wing," runs the account of one pilot. "That meant that he had seen the ships. . . . The 'Prinz Eugen' was steaming along very slowly at the head of a tremendous line of ships. Destroyers were trying to lay a smoke-screen round her. . . . At that moment I saw two Me.109s fly across in front of me. . . . They circled to get on our tail and the 'Prinz Eugen' was in my sights." He dropped his torpedo and then the Beaufort became involved in a heavy fight with the Messerschmitts. One of them was shot down and the other made off. "My Beaufort was hit in twelve places. . . . A bullet had gone through a propeller and a cannon shell had ploughed a furrow in the tail-plane. The action was fought very near to Over Flakee Island off the Dutch coast. We thought the name appropriate the circumstances."

In this confused and unsatisfactory action the palm for courage, cold and unshaken, has rightly been awarded to the Swordfish of the Fleet Air Arm, which, operating from one of the South coast bases of Coastal Command, delivered their attacks about noon. They





The pocket-battleship "Lützow," sighted on 12th June, 1941, was attacked by Beauforts which almost certainly scored two torpedo-hits.

came in low in two flights of three in the face of tremendous and accurate anti-aircraft fire, with swarms of enemy fighters about them, and all discharged their torpedoes. They were all shot down, and of the eighteen members of their crews only five survived.

The next occasion on which the "Prinz Eugen" was attacked by Coastal Command was on 17th May, 1942, when she was found off the Southern tip of Norway steaming southward. She was on her way to a German port for repairs made necessary because of the damage inflicted on her by H.M. Submarine "Trident." The attack was carried out by Hudsons and torpedo-carrying Beauforts escorted by Beaufighters and Blenheims. It was pressed home with the greatest determination in the teeth of heavy anti-aircraft and fighter opposition. The Beaufighters, sweeping ahead, raked the decks of the German vessels with cannon and machine-gun fire while the Hudsons and the torpedo bombers went in to the attack. In this action the rear gunner of one of the Beauforts beat off a series of attacks by enemy fighters lasting 35 minutes, though one of his guns had jammed and he himself had been wounded in the face, hands, legs and head. Five enemy fighters were shot down, and we lost nine aircraft.

The attacks by Coastal Command on enemy shipping have, as yet, reached no climax and no end. All that they have so far achieved cannot be known. Not every German convoy is sighted, not every ship attacked sinks. The other side of the North Sea is often shrouded in mist, literally and metaphorically. At times it lifts for a moment to disclose a tanker or a supply vessel with their waspish escort of destroyers or flak-ships, and it is possible to catch a glimpse of what the enemy is using to maintain the flow of his supplies and of the difficulties and troubles he is encountering. That these are great and increasing there is much evidence to show.

The success of our operations, however, is not to be measured merely in terms of shipping sunk. If the enemy loses a large number in any one place the obvious inference is that he is using this particular route very frequently, and that therefore for each ship sunk several very probably get through. On other routes the number of sinkings may be smaller because the menace of air attack is so great that the Germans can no longer accept the losses incurred by following them, and have been obliged to find other means of transport. There is no doubt that important trade routes have had to be abandoned in the face of our air attacks.

It is impossible for our air attacks, with the resources available at present, completely to stop all coastwise traffic. Moreover, the state of the weather must always be a factor of cardinal importance. Aircraft of Coastal Command cannot, as yet, operate heedless of cloud Fighter protection is not always cover. possible; the waters in which targets are to be found are too far off. Blenheims, Beauforts and Hudsons must still go out into the murk of a foggy day alone and unescorted to strike at such targets, themselves the target for German fighters, swift to engage from aerodromes near the coast, and for the fierce fire of ships desperate in defence.

Sometimes a "strike" is what the word implies—one clean stroke carried out in the course of a single flight. Sometimes it is a running engagement which must be fought against opposition that will increase as the minutes and the hours go by. In the two short hours which must elapse between the moment when the presence of a ship within range is signalled and the moment when the striking

force arrives to attack it, that ship can vanish into a protecting curtain of mist or a narrow, cliff-bound fjord. To fight such an enemy is often to fight a shadow.

Shall I strike at it with my partisan? . . .

'Tis here,

'Tis here.

'Tis gone.

Yet a steady toll is taken. Day by day the score mounts, the burden on the enemy's railways, roads and canals increases. A time will come when it will prove too heavy, and then the sustained effort, the unwearying persistence of Coastal Command will have their reward.

15: Their Spirit is Serene

THIS STORY is an attempt to describe the exploits of a force still at close grips with the enemy. It is therefore a chronicle of contemporary events and as such must fall far short of the whole truth. The pattern of their deeds is being woven on the loom of history by the pilots and crews of Coastal Command; but the tapestry is not yet complete. Not until, bright with the gold of victory, the last threads have been drawn into place will the finished picture be seen in all its detail of triumph and setback, of courage, hardihood and achievement. Yet the general design and its many outlines are clear enough.

It is a seascape, the largest yet depicted, for it embraces most of the Atlantic Ocean. To fight and win the Battle of the Atlantic has always been the main task of Coastal Command. It carries this out in many ways—by protecting convoys, by anti-submarine sweeps and patrols, by "strikes" against U-boats and surface raiders, by combat with enemy aircraft, by attacking his bases, by unending reconnaissance over the sea and along his coasts. All this

activity is directed to one end: to aid the Royal Navy in frustrating the enemy's endeavour to blockade Great Britain and to prevent supplies from passing into her ports or out of them.

In the fulfilment of these duties aircraft of Coastal Command, between 3rd September, 1939, and 30th September, 1942, has escorted 4,947 merchant convoys, attacked 587 U-boats, and, if offensive operations against enemy shipping are included, flown some 55 million miles. This is a considerable achievement, especially if it is realised that to attain such a rhythm of activity the force has had to undergo a considerable expansion from a comparatively small beginning.

Nor is this all. Coastal Command is not, and never has been, only on the defensive. It is not merely content with striking down the attacker in whatever guise he may show himself. It carries the war into his own waters. The mine, the torpedo, the bomb—all three are to be found in its armoury. The first and second have taken a heavy toll of the enemy's shipping; the third has, in addition, lit many a fire and blasted many a hole in the buildings and workshops of his bases.

Coastal Command is an air force in miniature. Its Sunderlands and Catalinas range the ocean to protect our ships; so likewise do its Beauforts and Blenheims, its Whitleys and Wellingtons, its Hudsons and Liberators, but they are also a bombing force capable of instant use against a wide choice of targets; its Beaufighters and Blenheim fighters join combat with the Luftwaffe at ranges beyond those within the compass of Fighter Command. It is an amphibious force in the sense that, though its element is the air, it makes use of both land and sea to provide it with bases from which to set out against the enemy. Its aircraft fly over the restless waters of the Atlantic, the Channel and the North Sea, over the pack-ice about the shores of Greenland, over the desert scrub and palms of West Africa, over the stern mountains of Norway and Iceland, over the wide fields of France, over the iron and concrete buildings of Reykjavik, the wooden houses of Trondhjem, the brick-built mansions of Rotterdam, the lighted windows of Nantes.

Theirs is a wide and varied battle-field. With other Commands, they experience the triple onslaught of flak, fighters and bad weather;



but for Coastal Command the last is of special significance. Not once but many times have flying boats been compelled to circle for hours till dawn because low cloud, fog, rain, snow or mist made alighting on the sea impossible in darkness. The weather forecasts, much of them based on the reports furnished by the pilots of the Met. flights carried out daily by the Command, have a peculiar value for men whose calling takes them for many hours many miles from land over the bounding and abounding waves.

What do the pilots and crews of Coastal Command see during their strong, monotonous flight? Such things as these: the curve of the shore as they leave and approach it, and grey mist smoking from the surface of the sea; and the wake of a ship in moonlight, and the bubbles bursting in the track of a torpedo; and the coloured balls of flak which come up so slowly and then arrive with a sudden, furious rush; and the light foam about a periscope; and the circles made by depth charges: and always

the expanse of ocean with the clouds overhead, and sometimes upon it a patch of oil . . . an empty raft . . . an upturned boat . . .

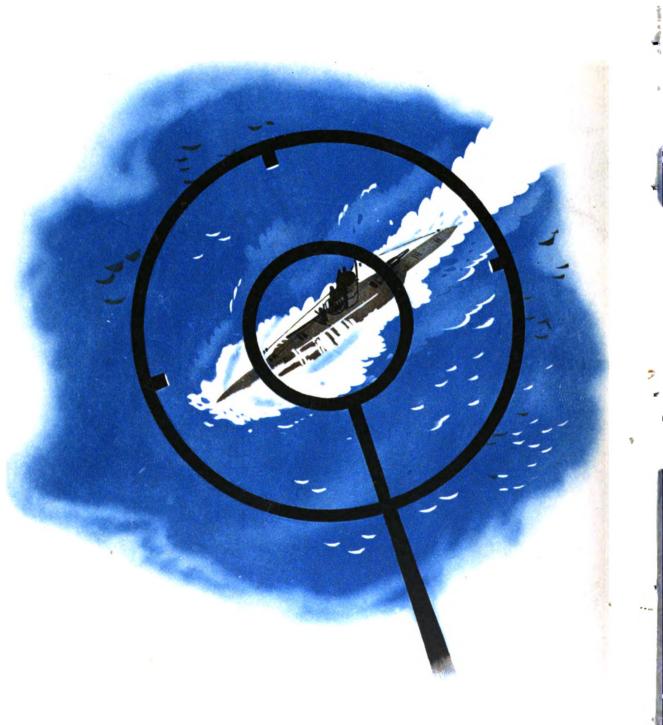
It is time to leave them. Their story has in part been told. Many fine achievements lie behind them; many more will be theirs before this war is over. Their spirit is serene, for, though humble of heart and at times envious of their comrades whose duties bring them into more frequent contact with the common foe, they know the importance of their task.

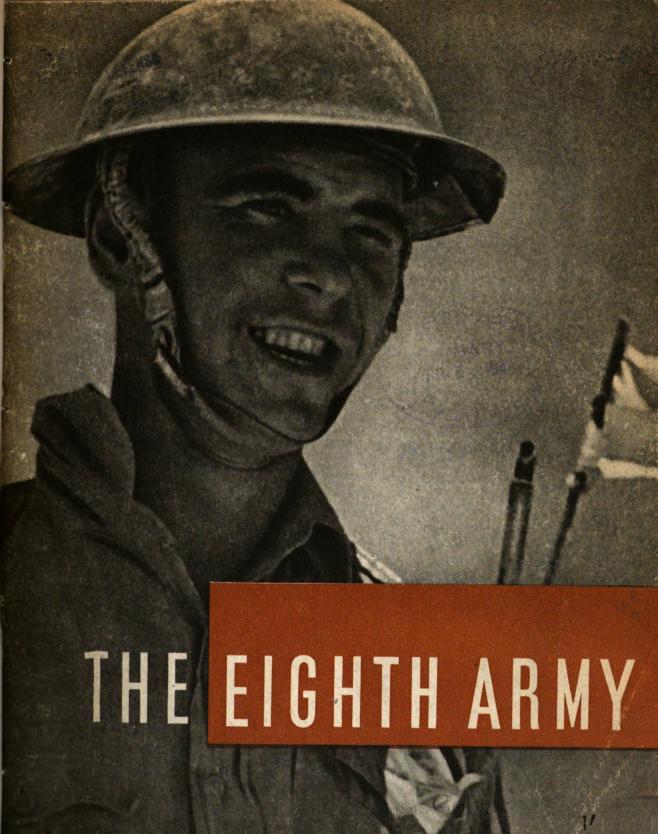
As these words are being written some of them are talking with their navigators, plotting the best course for a "Rover" along the moon-lit shores of Holland, Belgium or France, others are being briefed for a "strike" on enemy shipping in a Norwegian fjord, others are landing from a U-boat patrol, others are resting before going aboard their flying boats for one more sortie over the Atlantic. They will take off in darkness and, with "no shapes but the keen stars" to guide them, they will be above the convoy at dawn.





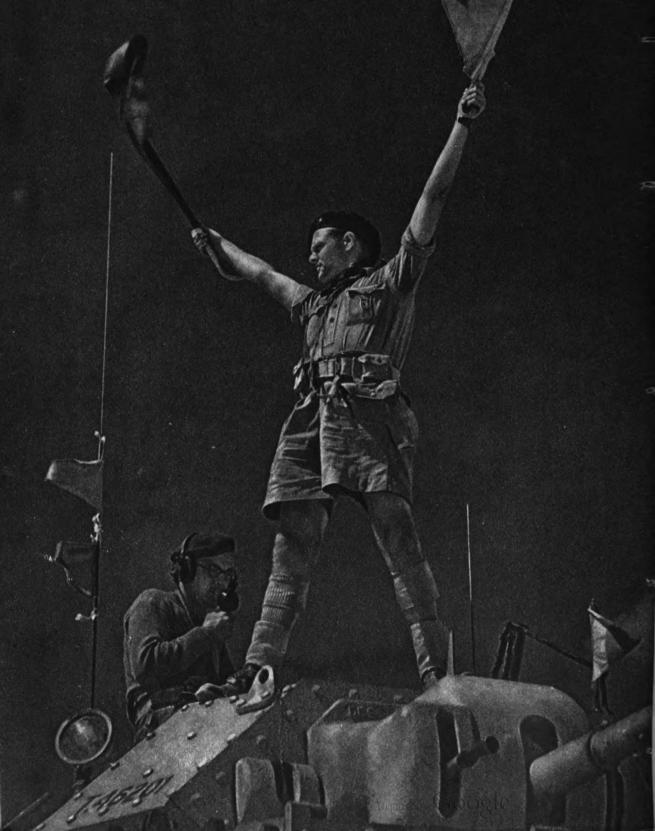












T H E A R M Y



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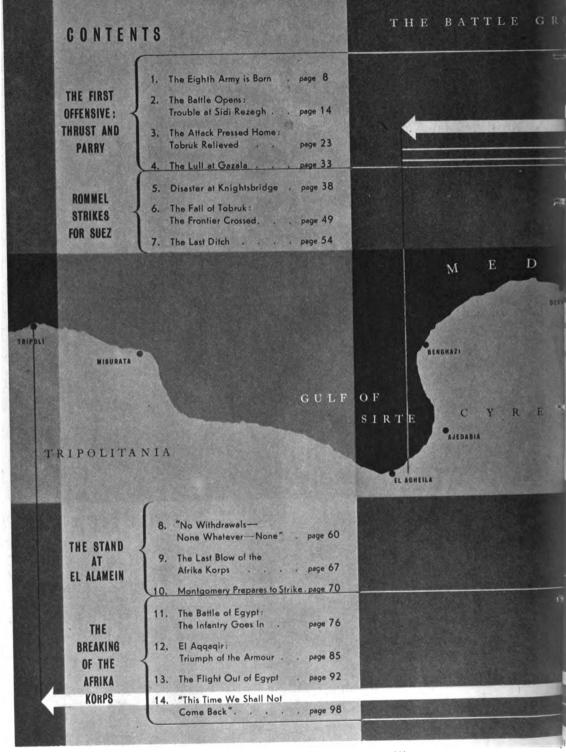
THE EIGHTH ARMY

SEPTEMBER 1941 TO IANUARY 1943

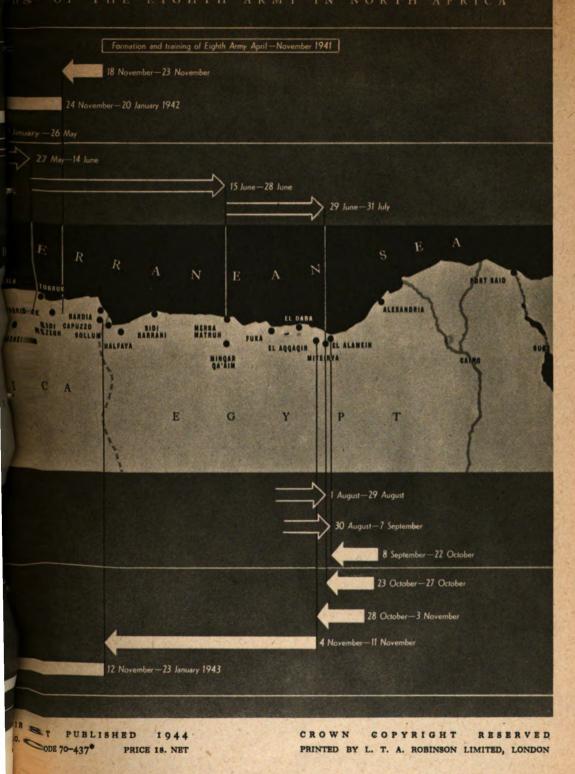
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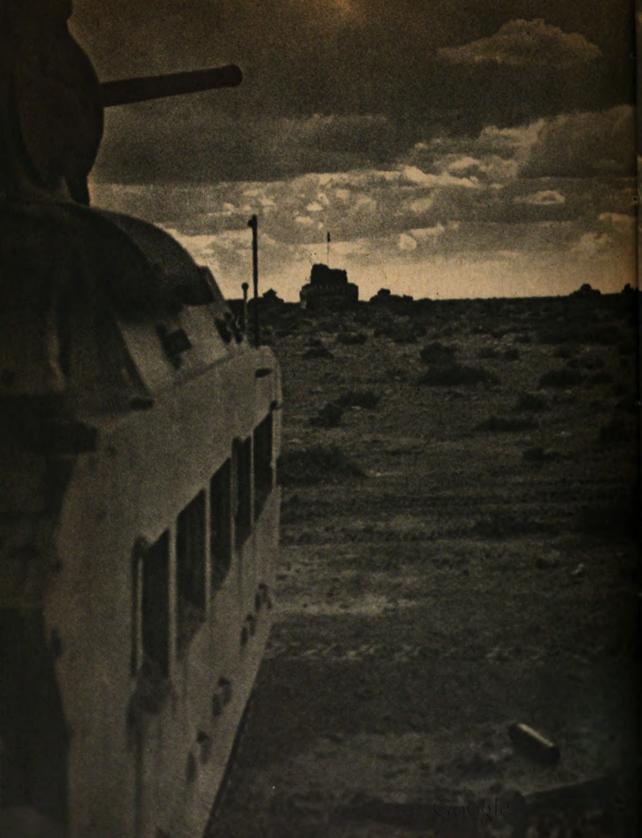
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THE FIRST OFFENSIVE: THRUST AND PARRY

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FOREWORD

The first occasion on which the name "The Eighth Army" appeared in print was when General Sir Alan Cunningham was appointed as its commander on 18th November, 1941, though it was officially known as the Eighth from 26th-27th September. This book covers the whole of its life history as a completely independent force. After the landing of the Americans and the First Army in French North Africa on 8th November, 1942, there was always a sense of strategic coordination of the operations of the two Armies, since the plain strategic purpose was to pinch the Axis out of the continent between them; but there was no direct tactical co-ordination until the amalgamation of the First, Eighth, American, and French Armies into the Eighteenth Army Group on 20th February, 1943, when all had reached Tunisia.

In the construction of this book the aim has been to follow out, so far as possible, the contributions made by the different units, while preserving a consecutive story of the whole Army. From time to time passages have been included from accounts furnished by men who took part in the fighting. They have been selected to show what a desert campaign is like, to illustrate the kind of operation required of different kinds of units, and, very occasionally, to relate some specially outstanding exploit.

No attempt has been made to describe the work of the Navy and of the R.A.F. except in terms sufficient to show that the victory of the Eighth Army would have been impossible without them.

1. THE EIGHTH ARMY IS BORN

"The British Eighth Army represents the most modern and most powerful force to be found to-day on the different chess-boards of this world war. The infantry is perfectly trained, shows great fighting spirit and has armament and equipment better than those of any other infantry in the world. The British artillery is well provided with excellent guns and is splendidly organised, and the British armoured units are among the best in the world. Its leaders and staffs are carefully chosen and have proved their worth on the battlefield. Finally, the Eighth Army has some 10,000 motor vehicles and has both a naval and an air fleet at its disposal. The co-operation between the R.A.F. and the land forces can serve as an example for anyone."

This extract from an official Italian report on the battles of Mareth and Akarit gives an opinion of the Eighth Army which modesty would prevent a British writer from inscribing. Though the estimate of the Army's motor vehicles was, in fact, a gross understatement, the general verdict should be taken with a pinch of salt. Given comparable opportunities and leadership, other British armies have proved to be on the same high level; and the Italian commentator may well have been influenced by the fact that nothing puts a beaten army in a better light than praise of its victorious opponents. But in substance it was true when written in April 1943, and has remained true since; and there is some gratification in noting that the Eighth Army, in the opinion of its adversaries, was a better military instrument than the Afrika Korps.

It was not always so. The Eighth Army was born at a critical moment in Britain's fortunes. It was the child of the Army of the Nile, which, under General Wavell, had utterly destroyed the Italian Army in Libya, only to be brought to the brink of destruction itself by a German counter-offensive launched when it had been greatly weakened to keep the promise given to Greece. The credit for

holding the enemy on the Egyptian frontier and for holding on to the outpost of Tobruk belongs not only to the men on the spot, but to those at home who had the courage and vision steadily to reinforce the Middle East while Britain was still threatened with imminent invasion.

But nothing which could be sent over lines of communication 12,000 miles long could make the Eighth Army into a formidable striking force for many months; and there were distractions which prevented entire concentration in Libys. In the first place, Syria had to be secured against Axis infiltration, and Iraq rescued from a pro-Axis rebellion. Secondly, after the German assault on Russia in June 1941, the road from the Persian gulf to the Caucasus had to be secured and improved. Thirdly, the ever-growing menace of Japan dictated some measure of precautionary reinforcement of the Far East. All these things had to be done at a time when, with the notable exception of the people of the British Empire themselves, most of the world was expecting an early Axis victory: and, human nature being what it is, was not so enthusiastic as its inclinations might otherwise have prompted it to be.

There is another factor which must be taken into serious account in assessing the tasks and achievements of the Eighth Army. namely the very special character of the country in which it had to fight. What may be called the cinema impression of a desert is nothing like the Western Desert. There is much less sand than one expects, and the sandstorms so often mentioned are more frequently choking clouds of dust rather than sand. Vast stretches are hard, firm going (except after rain), and resemble flat rock more than anything else. There are practically no features in the landscape, other than occasional shallow depressions which allow tanks to get into hull-down positions.

Where the Western Desert is true to convention is in its lack of water. A water pipeline had to be constructed all the way from Alexandria nearly to Tobruk, and this

supply eked out with the rather brackish water obtained from local wells. Even so, the normal ration was one gallon a head a day for all purposes, and the amount actually reaching the troops was often not quite as much. Among the more disagreeable features are the flies. They are a filthy, pertinacious, excruciating pestilence. As for the climate, it is not so trying after a time, and most people found it healthy enough, except when the hot winds, or khamsin, were blowing. These winds are completely horrible. Physically, they seem devoid of oxygen. Morally, they make the most placid temperament morose.

It will be seen that everything in the Western Desert was totally unfamiliar; and it follows that troops required weeks of training in local conditions before they could be considered "desert-worthy," that is to say, really battle-worthy. To give only two examples of the special demands made on soldiers by the desert: in a country so devoid of cover most movement had to be made by night, and every vehicle crew had to be able to cook for itself in an area where wide dispersal is the normal formation. Perhaps the best verdict on the peculiarities of the desert was pronounced by General von Ravenstein, the captured commander of the 21st German Armoured Division. "The desert," he said, " is the tactician's paradise, but the quartermaster's hell!"

In these circumstances it was surprising that General Auchinleck could launch the Eighth Army's offensive as early as November, 1941.

Between February and that month the Axis had succeeded in collecting a formidable force in Libya. It consisted of two German Armoured Divisions (the 15th and the 21st), the 90th German Light Division, one Italian Armoured Division (the Ariete), and seven Italian infantry divisions (the 17th Pavia, the 25th Bologna, the 27th Brescia, the 55th Savona, the 60th Sabrata, the 101st Trieste and the 102nd Trento—the last two being motorised). The whole of this formidable army (except the Italian 60th

Division) had been imported between March and May while our fleet was occupied in Greek waters and could not effectively interfere with trans-Mediterranean traffic.

Between May and November no complete enemy formations were brought across. There were many convoys, bringing drafts, supplies, equipment, and ammunition during the summer and autumn but, despite our very serious losses off Greece and Crete, the Navy and R.A.F. succeeded in destroying between one-third and one-half of their cargoes on the way. The measure of success of the interception is that Rommel, after his blitz was stopped in April, could not gather enough strength for a first-class offensive until November. In spite of the immensely greater length of the Eighth Army's lines of communication, it can claim to have won the race for supplies, since General Auchinleck's offensive on 18th November anticipated by five days that planned by Rommel.

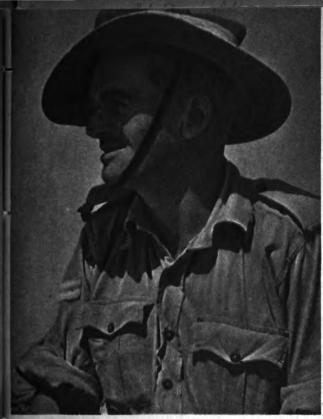
This offensive therefore caught the enemy with his dispositions readier for attack than for defence. The best of his troops, including most of his armour, were in the forward areas. Four infantry divisions were concentrated (and could therefore be contained) around the Tobruk lines, and his general reserve, consisting of the Ariete and Trieste Italian divisions only, was on the upper desert plateau.

For its part, the Eighth Army had been organised for the assault into two main formations, namely the XIIIth Corps, under Lieut.-General Godwin-Austin (later under General Gott, at this stage commanding the 7th Armoured Division), and the newly formed XXXth Corps under Lieut.-General Willoughby Norrie. The composition of these Corps was radically different. Units of the XIIIth Corps included the 2nd New Zealand Division, the 4th Indian Division, and the 1st Army Tank Brigade-in fact, the Corps was mainly composed of infantry. The 7th Armoured Division, the 1st South African Division and the 22nd Guards Brigade made up the XXXth Corps. In Tobruk



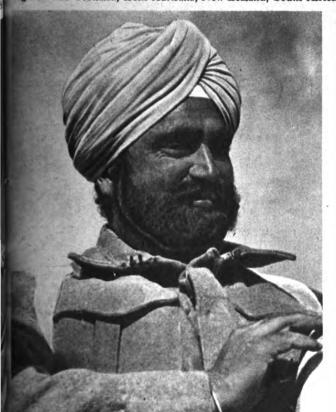
THE MEN OF THE EIGHTH ARMY came together from







England and Scotland, from Australia, New Zealand, South Africa, and India. Its soldiers were such men as these.





were the 70th Division, a Polish Brigade and the 22nd Armoured Brigade.

At the risk of breaking the thread of this narrative, it is pertinent to describe in rather more detail some features of the armour, since the impression prevailed at the time that it was superior to the armour of the enemy and that the job of wiping out two German armoured Divisions and one Italian should have been achieved without extraordinary exertions.

The 7th Armoured Division, on whom the brunt of this task was to fall, contained three Armoured Brigades besides the famous 7th Support Group under that military Drake, Brigadier Jock Campbell, who won his V.C. in the battle. The three Armoured Brigades contained 455 tanks in all; but, of these, 165 were the light Stuart type, now classed not as a tank but as a good reconnaissance vehicle; the rest were mainly Crusaders. It may be argued that every tank in the Eighth Army, whether in the XXXth Corps or not, should be counted. So be it. This adds to the total 120 Matildas and Valentines of the 1st Army Tank Brigade, and 90 similar tanks of the 32nd Army Tank Brigade in Tobruk.

The Eighth Army therefore had 665 tanks of all sorts, as against 505 belonging to the Axis. But a mathematical count of this kind is utterly misleading, and a correct comparison of the strength of the two armies gives a very different picture. Over half the Axis tanks were German Mark IIIs and Mark IVs, both of which, as will be explained later in summing up the battle, were superior in armament, armour, and reliability to anything opposing them. None of the British tanks had a gun heavier than the twopounder; whereas those in the German tanks fired nothing lighter than a 41-lb. shell, and their heaviest gun a shell of 14 lb. Bravery and skill the Eighth Army had in full measure, but not equality in hitting power; and its ultimate success in defeating the enemy's armour was a miracle of human courage and ingenuity.

Again, the XXXth Corps, which was given the job of smashing the enemy armour, had another job as well—to protect the left flank of the largely unarmoured XIIIth Corps. If, therefore, the XIIIth Corps and the Tobruk tanks are left out of account, as they at least ought to be during the earlier stages before they entered the battle, it will be seen that the XXXth Corps had not even numerical equality in tanks to do its double job.

No account of the dispositions for the battle would be complete which omitted the attempt to disorganise the enemy by raiding Rommel's Headquarters more than 200 miles behind the enemy's front. This task was entrusted to Lieut.-Colonel Keyes of the 11th Commando, who had already added lustre to a famous name by his conduct at the crossing of the Litani river in the Syrian Campaign.

Lieut.-Colonel Keyes, Lieut.-Colonel (now Maj.-General) Laycock, five other officers, and 53 N.C.O.s and men, were taken a threeday journey in two submarines (Torbay, under Commander Miers, V.C., and Talisman) along the coast to the beach selected for landing. The weather was rough, with heavy rain, and it was bitterly cold. Great difficulty was experienced in launching the rubber boats, one of which capsized three times before its drenched and buffeted occupants reached the shore. Fortunately the enemy were not about, and they were met by a British Intelligence Officer with some friendly Arabs who were able to light a fire, screened from the landward side, to dry and warm the soldiers. Colonel Keyes and all but two men, who were injured, got ashore from Torbay, but only Colonel Laycock and seven other ranks succeeded in landing from Talisman. Colonel Laycock and three men stayed at the rendezvous.

After dark on the night of 15th November, the raiders—now reduced to Colonel Keyes, Captain Campbell, Lieutenant Cook and 25 N.C.O.s and men—began their 18-mile walk to Rommel's Headquarters, reported



THE MEN OF TOBRUK. Seventy miles to the west of the frontier where the main armies stood, the fortress of Tobruk was in the eighth month of its siege. This is a post on the outer defences. The men are firing a captured Italian mortar.

to be at Beda Littoria. The weather was horrible, and after a few miles the Arab guides refused to go on. The party therefore went on alone and managed, during the following night, to reach a previously selected spot about ten miles from Beda Littoria, where they made a cache of surplus clothes and food. On the way they ran into a party of Arabs who proved to be friendly but told them that Rommel's Headquarters were not at Beda Littoria, but in a house at Sidi Rafa. Fortunately, Colonel Keyes decided to trust them, and amended his plans accordingly. The next night, the friendly Arabs led them to within a few hundred yards of the house. As they waited for zero hour-one minute

before midnight — some other Arabs in uniform appeared. They seemed suspicious and were certainly hostile, but Captain Campbell, being a first-class German scholar, bluffed them into believing the party belonged to a German unit.

After detailing various covering and diversionary parties, Colonel Keyes, Captain Campbell and Sergeant Terry were left to deliver the attack on the house itself. Colonel Keyes tried to find a way in through the back, but the windows and doors were too securely fastened to be opened without noise. The party therefore walked boldly round to the front door, at which Captain Campbell knocked, crying loudly for admission.

A sentry opened the door, but could not be overpowered without a struggle, and Campbell shot him with his revolver. The hunt was up. Leaping over the body, Colonel Keyes flung open the door of the front room. Any slower manœuvre would have meant that the enemy would have come into the passage, seen that there were only three assailants and easily overpowered them. In the first room, where the lights were on, this method succeeded. The room was crowded with officers and orderlies, and as Keyes emptied his revolver through the doorway, Campbell lobbed in a grenade.

Meanwhile, Terry stood with a tommygun at the foot of the stairs and drove back a rush of officers trying to come down from the first floor. A second room on the ground floor was also occupied; though the lights were out, heavy breathing and scuffling could be heard inside. Without a moment's heaitation Keyes flung open the door, but was greeted with a volley of shots and fell back into the passage mortally wounded. Terry emptied his tommy-gun into the room and Campbell threw in two grenades, which burst as he slammed the door. The two men carried Keyes outside, but he died within a few minutes. The covering party then came up and threw grenades through

every window in the house. The enemy was in complete confusion and in the stray firing which followed Campbell's leg was broken by a bullet. He had to be left behind, but not before he knew that the electric plant had been successfully blown up. Though missing for many months, he was finally reported to be a prisoner in Germany.

The main purpose of the raid—to put Rommel himself out of action—failed because by pure chance the German General was away at a birthday party. But the German H.Q. were at least temporarily disorganised. Four high staff officers were killed, and Colonel Keyes was buried with them. His brother, on reaching Sidi Rafa during the following months, found all five graves, and the Italian verger of the local church gave him a photograph of the five coffins lying before the altar. Colonel Keyes was posthumously awarded the Victoria Cross for this exploit in which he displayed all the qualities required of the highest class of soldier—imagination, organising ability, supreme daring, and selfsacrifice. His last letter home pictures his character better than any account of what he did. "If the thing is a success, whether I get bagged or not, it will raise our stock a bit and help the cause." In that spirit the Eighth Army went to battle.

2. THE BATTLE OPENS: TROUBLE AT SIDI REZEBH

The Eighth Army's plan for the battle was therefore even more ambitious than it appeared—and it appeared ambitious enough. The directive given to its Commander, General Cunningham, was to sweep the enemy right out of Cyrenaica. For this purpose, he proposed to launch the XXXth Corps in a wide sweep west from the Maddalena area and then north towards Tobruk. The Corps was to trail its coat for the enemy armour,

which, it was hoped, would sally out to battle and be smashed. When the enemy had revealed what he intended to do with his armour, the XIIIth Corps was to attack northwards and isolate Bardia and Sollum.

After the hoped-for armoured victory, the XXXth Corps was to relieve Tobruk, whose garrison was simultaneously to make a sortic on receipt of an arranged code word from the XXXth Corps Commander. Caught





AS THE EIGHTH ARMY STRIKES WEST across the frontier, the Tobruk garrison prepares to break out eastward to join it. Above, the first troops pass through the frontier wire. Below, men of the tanks and armoured cars of Tobruk wish each other well before setting out.



between the three hammers of the two Corps and the Tobruk garrison, the enemy was to be annihilated.

At first all went well. Beginning on 18th November, the advance of the XXXth Corps took the enemy by surprise. It is now known that for nearly 48 hours Rommel thought he had to deal only with a reconnaissance in force. This mistake did not, however, work out wholly to his disadvantage, because it meant that he did not at once accept the challenge to fight a great armoured battle. It had been hoped that a swift advance of 90 miles to Gabr Saleh would be sufficient to provoke him, but in point of fact the ground thus occupied was not vital to him, and it might have been better had the Eighth Army gone straight through to El Adem or Sidi Rezegh when he would have been forced to fight at once. The first day's advance, therefore, though carried out without incident and under a fighter cover which kept the enemy completely out of the sky, afforded few indications about what to do next.

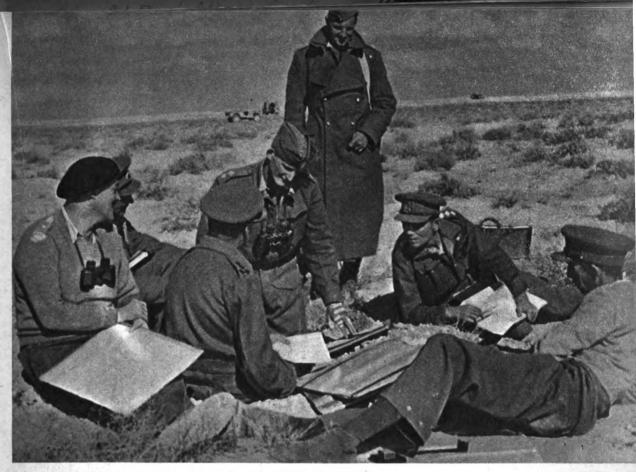
Early next morning, the Army Commander who had moved with the XXXth Corps H.Q. decided that the armour should resume its advance north-west. As a result, the 4th Armoured Brigade found and engaged some 60 enemy tanks north of Bir Gibni, and the 2nd Armoured Brigade fought a fierce battle near Bir el Gubi, destroying 45 tanks, most of which were Italian, and taking 200 prisoners.

About noon the 1st South African Division started to move north in the direction of El Duda. In the afternoon the 7th Armoured Brigade made a swift and successful dash for Sidi Rezegh, and the 6th Royal Tank Regiment surprised and captured the airfield. They destroyed 19 out of 21 aircraft found there, the other two just getting off in time, like pheasants rising from cover just as a dog reaches them.

These engagements were enough to make Rommel realise that the XXXth Corps' attack was a major offensive. He therefore decided to effect a junction between the 21st Panzer Division and the Ariete Division west of Bir el Gubi and with them to attack eastwards, while a westward sweep by the 15th Panzer Division from the Sidi Omar area would join in annihilating the advanced troops. The result of these movements was the first battle of Sidi Rezegh.

While the enemy was thus making up his mind on 20th November, the XXXth Corps was busily strengthening its hold on Sidi Rezegh. The 7th Armoured Brigade and the Royal Horse Artillery repulsed an enemy counter-attack on the airfield early in the morning, and a few hours later the 7th Support Group arrived. The enemy was found to be in some strength on the escarpment, but it was confidently expected that his defence could be broken, and the word was therefore flashed to the Tobruk garrison to begin their sortie next morning. The 5th South African Brigade was on its way up. though delayed by air attack and by the difficulty it found in moving by night, and everything seemed set for the relief of Tobruk.

When next morning broke, however, there were ominous signs that very large enemy forces were moving up from the south to attack Sidi Rezegh. Nevertheless, Brigadier Campbell's men held to their purpose of clearing the northern escarpment and advancing across the Trigh Capuzzo to meet the Tobruk force at El Duda. The 60th Rifles and a company of the Rifle Brigade carried the escarpment, and the 6th Royal Tank Regiment made a gallant attempt to cross the track. But all the tanks that did so were knocked out. and only the escarpment could be held. Meanwhile, the enemy was advancing rapidly from the south. All day he was held off with great gallantry and difficulty by the 7th Armoured Brigade (which was reduced at nightfall to 20 tanks) and by Brigadier Campbell's Support Group. He was finally checked by an extraordinary feat of arms when Brigadier Campbell in an open car led the remaining 12 tanks of the 6th Royal Tank Regiment, supported by a few mobile antitank guns, in a counter-attack. This brave



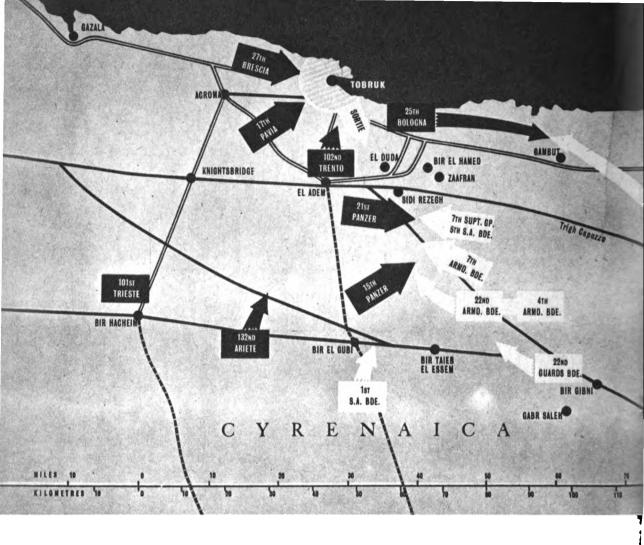
MAPS AND PLANS are spread on the sand as the Brigadier takes his decisions and gives his orders. It is the fourth day of the offensive, and the situation does not look bad. Next day, 22nd November, trouble began.

show kept our positions intact for the moment.

Not, unhappily, for long. On the morning of 22nd November, the situation appeared temporarily brighter. The 22nd and 4th Armoured Brigades were up, and about midday General Gott was able to get them into position to help the Support Group. Just previously the Transvaal Scottish of the South African Brigade carried the southern escarpment and came in view of Sidi Rezegh airfield. Early in the afternoon a very heavy tank battle developed, with the enemy trying to reach the Support Group, and the 22nd Armoured Brigade, supported later by the 4th Armoured Brigade, holding them off by magnificent fighting in a synthetic dust storm caused by charging tanks and bursting shells.

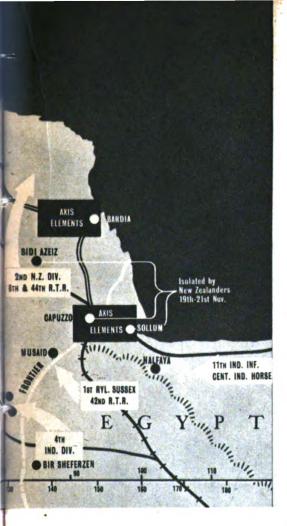
Until dusk the enemy was held; but he then massed his remaining tanks and in a sustained attack, with the setting sun behind him, forced the 7th Support Group off the airfield. No praise can be too high for the men of this group who had held off constant attacks for three days and succumbed finally only to sheer weight of numbers, with their guns firing until the enemy reached their muzzles, and their units, particularly the 6oth Rifles, enduring heavy casualties without flinching.

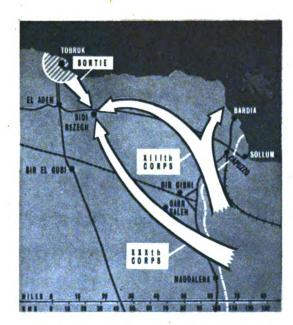
Meanwhile, the 5th South African Brigade was concentrated and digging in on the southern escarpment, supported by what was left of the 22nd Armoured Brigade. During the morning of the 23rd two small



tank attacks were easily repulsed, but early in the afternoon very heavy infantry and tank attacks were launched against the northern flank of the Brigade under cover of an artillery barrage. These attacks also were repulsed, but just as the South Africans were beginning to think the enemy had had enough for the day, a mass of 108 tanks, supported by lorried infantry and artillery, appeared. This avalanche fell on the South African Irish, the Transvaal Scottish, the Botha Regiment, the relics of the

and Armoured Brigade and the South African Brigade artillery. All of them put up a fine fight. Firing at point-blank range with all they had, they knocked out 52 tanks, and there is little doubt that this resistance had a profound effect on the subsequent course of the battle. But it was apparent when the dust and clamour of the engagement died down that the 5th South African Brigade had virtually ceased to exist and that no junction could be effected by the XXXth Corps with the sortie from Tobruk.





ABOVE, THE PLAN. LEFT, STUCK AT SIDI REZECH. The goal of the Auchinleck offensive of November 1941 was the junction around El Duda of the Tobruk garrison, the XIIIth and XXXth Corps, and the crushing of the Axis forces between them. But on 23rd November the Tobruk sortic and the two Corps were all stuck. The XXXth Corps, striking upwards from Maddalena, took Sidi Rezegh but could not hold it. The advanced troops of the XIIIth Corps were held at Gambut, and the Tobruk garrison could not pass the half-way point to El Duda.

Gallantly begun by the Polish Brigade, which drew the enemy's attention to the western end of the perimeter, the sortie was made, by the 70th Division, at the eastern end early on 21st November. Headed by the Black Watch and the machine-gun battalion of the Northumberland Fusiliers, and supported by some tanks, the garrison, at the cost of heavy casualties, got half-way to El Duda, taking 1,100 prisoners en route.

It is now time to revert to the operations undertaken by the XIIIth Corps, which was

attacking northwards from the Egyptian frontier with the aim of isolating the large enemy forces round Bardia and Sollum. The blow was to be delivered after the XXXth Corps had got well on with its task, but the preliminary deployment involved some brisk actions. At night on the 19th-20th, some of the New Zealanders took Fort Capuzzo and occupied Sidi Azeiz; others, with the 8th and 44th Royal Tank Regiments, cut the road and water pipeline on the escarpment between Bardia and Tobruk and took nearly 400

prisoners. Another detachment took Musaid and Sollum barracks on the night of 20th-21st November.

At midday on the 22nd, the 7th Indian Brigade of the 4th Indian Division attacked the Sidi Omar forts on the frontier. The Royal Sussex Regiment took Omar Nuovo; but when the 16th Punjab Regiment went through to attack Libyan Omar, the accompanying tanks suffered heavily from antitank guns and mines, and the infantry only succeeded in taking the eastern part of the position. Ten days later the 1st and 16th Punjabis finished the job.

On the 21st the XIIIth Corps began its major part in the operations. The New Zealanders captured Gambut, but thereafter were held up by Axis troops dispatched from the Tobruk investment lines to hold the Bardia road. That meant that no junction with the sortie could be effected by the XIIIth Corps.

On the evening of the 23rd, therefore,

the battle had reached a critical and far from encouraging phase. The sortie was stuck; the New Zealanders were stuck; Sidi Rezegh and Bir el Hamed were lost, together with the 5th South African Brigade, and most of the mauled but still indomitable 7th Support Group. Rommel had made the junction between the 21st and Ariete armoured Divisions, south-east of Tobruk and was well placed to destroy our advanced troops in detail. The lesson of the five days' fighting was that infantry, unless much better equipped to deal with armour, is an embarrassment in this kind of desert fighting. Captured positions could not be consolidated and held by men equipped with only a few two-pounder anti-tank guns to each battalion, particularly when, as in some units, they had had no opportunity for any serious desert training. In consequence, the Eighth Army's tanks were anchored to the infantry, whom they had to protect from being overrun by

SEVERE PROSLEMS FACED THE TANK SREWS. The German Mark III was greatly superior in fire power. The balance could be redressed only by thought and skill.



the enemy armour, and could not be released for their proper job.

Later, the infantry showed what they could do when properly equipped. When they were not, they could do nothing except fight gallantly against great odds. It may appear from this account that the enemy's armour had been decimated. It was thought that he started the battle with about 500 first-line tanks, and over 200 had been knocked out. Not all, however, had been destroyed. The later technique of wrecking all temporarily abandoned enemy tanks was already appreciated, but since the enemy's gun power too often gave him temporary command of a battlefield, it could not be fully applied, with the result that the enemy's carefully prepared system of recovery and repair had enabled him to salvage many of his machines. Moreover, the Army had its first experience of a factor which later was to prove extremely weighty. The Germans had two main types of tanks, the Mark III, armed with a 50 mm. gun, and the Mark IV, with a 75 mm. gun. The former was the machine most prominent in tank and tank clashes, the Mark IV being a supporting tank used mainly against infantry. The Mark III, with its 50 mm. gun, proved far superior to the two-pounder gun with which the British tanks were equipped. It could and did knock them out at nearly a mile range. The British armour made mincemeat of the lighter tanks; but most of the enemy's surviving armour was composed of these heavier machines which were more than a match for it.

These serious considerations were very present to the mind of General Cunningham, the Commander of the Eighth Army. He had won a tremendous and well-merited reputation for drive and daring in the Abyssinian campaign when he had commanded the Army in its startling rush from the Juba to Addis Ababa, and his appointment to command the Eighth Army had been particularly welcome to the South Africans. By a curious coincidence his

brother was in command of the Fleet, and the commander of the air forces was called Coningham, so that a Low cartoon at the beginning of the battle showing a van labelled "Cunningham, Cunningham and Coningham—Removal Contractors" was a neat summary of Allied hopes. General Cunningham was certainly not a man to cry halt without good reason. He had tried resolutely to carry out General Auchinleck's plan of campaign. But he now reached the conclusion that it could not be done, that the operation should be abandoned, and all troops withdrawn for re-grouping.

Nothing is more fatal than to entrust the conduct of a battle to a commander who does not think he can win it. Lee might have won at Gettysburg if he had replaced Longstreet after the latter had declared that Cemetery Ridge could not be carried. In the circumstances, General Auchinleck, after a personal visit to advanced H.Q., decided to entrust the command of the Eighth Army to his own Deputy Chief of Staff, Major-General Ritchie, who had taken part in all the original planning and was intimately acquainted with his views and processes of thought.

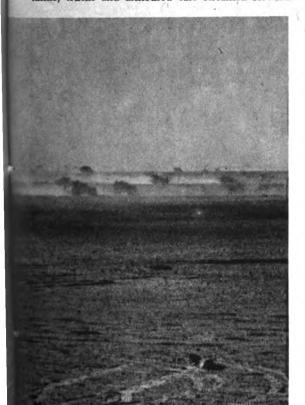
The continuation of the battle, if there was still the slightest chance of military success, was dictated by every other consideration. The whole of the Middle East had been keyed up to expect a resolute trial of strength. The troops had started the battle convinced that at long last they were to fight the enemy on more or less equal terms. Malta's supplies at this hour were low, and the possession of the Cyrenaican airfields, from which cover could be given to convoys, was an essential objective, apart from anything more ambitious. The political and military consequences of recoil would have been appalling. The event proved that General Auchinleck was right in thinking that victory could still be won, and afforded an interesting example of how the personality of a commander can still permeate a modern army.



AS THE OFFENSIVE WAS RESUMED, flying columns of Indian infantry and South African armoured cars swept down on Jalo and Aujila oases. Heavy fire was sweeping the approach to Jalo as the Indian troops attacked.



AT EL GUBI, southern end of the main position, tanks, trucks and armoured cars streamed forward.



3. THE ATTACK PRESSED HOME: Tobruk relieved

It took exactly three weeks to defeat the enemy decisively, but that was finally done in one practically continuous battle. At the outset—on 24th November—the enemy himself was quite hopeful of victory. Faced with renewed and fairly successful attacks by the XIIIth Corps and the Tobruk garrison, Rommel staged a dramatic movement on the lines of, but on a very different scale from, an Eighth Army diversion far to the south, where a flying column of the 2nd Punjab Regiment and the 6th South African Armoured Car Regiment, composing a body known as "E" force, took first Aujila and then Jalo.

Rommel's object was to disrupt the Eighth Army's rear and thus stop the offensive altogether. Collecting all he had to spare, he sent many columns of tanks, vehicles, and guns dashing through the British lines on the morning of 24th November. These columns made for the Egyptian frontier, and then turned north on a wide front, shooting up everything they encountered. Friend and foe were mixed up in the vast spaces of the desert, and there was at least one case at twilight where a British military policeman was directing German transport in mistake for our own. The H.Q. of the 1st South African Division were shot up by tanks at short range. The H.Q. of the 7th Armoured Division, with which was the Commander of the XXXth Corps, were surrounded and had to fight their way out in the dark. Supply columns near Bir Sheferzen and Maddalena were dispersed. For two days it was an exciting and anxious time, but by standing fast, and dashing in on the enemy columns wherever they were found, the Army, supplementing ceaseless bombing by the R.A.F., gradually defeated the enemy's purpose. Two notable actions were the stands of the 1st South African Brigade at Bir Taieb el Essem, and of the 1st Field Regiment covering the 11th Sikhs, east of the Omars. The work of the Armoured Car Regiments—the 11th Hussars, and the 4th and 6th South Africans-was also outstanding. As a result, the raiding columns did not succeed in disorganising the Army; finally they collected themselves and moved north-west to strike in upon the rear of the New Zealanders who were now pushing along the Trigh Capuzzo.

The enemy arrived in the main battle area rather too late for his job, though he picked up a lot of tanks and German infantry from the frontier which would otherwise have been lost. But on the night of the 25th-26th the New Zealanders fulfilled their mission of recapturing Sidi Rezegh, which was taken by the 24th and 26th Battalions, while the 18th and 20th Battalions recaptured Bir el Hamed. Next day, 26th November, the Tobruk garrison burst through the last of the investment lines, destroying most of the Bologna Division, and captured El Duda.

By early next morning contact with the New Zealanders was established and a corridor divided the enemy forces. On the west of it was the 15th Panzer Division with German infantry brought across from the Halfaya area. On the east were the 21st and Ariete Divisions. The raiding column had tried to interfere in the battle to establish the corridor but had been driven off east and south-west by our 4th and 22nd Armoured Brigades. On the 28th it tried again, and was again driven off south-east after hard fighting. An upsetting incident during the day of the 27th was the landing of a bomb on a table round which enemy staff officers were gathered on the Trigh Capuzzo. This may have helped in creating the disorganisation noticeable among the enemy next day. It was on this day that the Army captured its first—but not its last— German General, von Ravenstein, Commander of the 21st Armoured Division.

It was now clearly necessary for the enemy to cut through the corridor, and for the next three days he concentrated everything he' had on this purpose. By 1st December he had achieved it, and the 15th Panzer Division with a strong force of lorry-borne infantry of the 90th Light Division had broken through from the west to join the 21st at Zaafran. In this action the New Zealanders suffered very heavily, and the remains of their magnificent Division had to be withdrawn to Bagush to refit. The 5th Brigade, however, went back no farther than Tobruk, and took an outstanding part in subsequent operations. Eighteen months later the New Zealanders had full and ample revenge when the last remnants of the 90th Division surrendered to them in the massif of Zaighouan during the last hours of the Tunisian campaign.

Meanwhile, curiously enough, victory began to declare itself in what seemed to be the hour of defeat. This was not just an accident or a miracle. Apart from the fine fighting qualities of the troops, the development of a tactical instrument, first used in 1940 by the Army of the Nile, had proved extremely successful. This instrument was the "Jock" column, so called after Brigadier Jock Campbell, V.C., who was an expert in its use. His death in a car accident in March 1942 was a heavy blow to the Army.

The "Jock" column consisted of a battery of guns, a detachment of infantry, a few anti-tank guns, and some armoured cars with lavish transport. These columns, of which a number were formed, operated anywhere and everywhere as independent and self-contained units. They were most effective against the enemy's supply lines, and often put up a brave enough show to distract and occupy whole enemy Divisions whose absence from the main battle was an invaluable help. The Eighth Army contained numbers of young and spirited leaders with a natural grasp of

THE ATTACK PRESSED HOME

tactics. These young men seized their chances with both hands and thoroughly enjoyed themselves. Of course, as was found later, there was danger of exaggerating the use of this device. If there were too many "Jock" columns the forces of which they were composed became too dispersed when it was essential that they should be concentrated; but during the battle of November-December 1941 these columns did magnificent service.

They were certainly partly responsible for the hesitation which now became apparent among the enemy. Taking advantage of a bad break in the weather on and December, Rommel began to draw in his infantry and This concentration might mean either a new enemy attack or a new retreat. Both sides had been badly hammered, but the enemy seemed to think the British forces had suffered most. At any rate, the first use he made of his concentration was to contain their positions at Bir el Gubi, and send round his mobile forces to cut them off from their base.

They were, however, far too full of fight and far too strong in the air for this plan to succeed. On 3rd December, Rommel's concentrations in the Sidi Rezegh area were most successfully bombed. On 4th December, an Indian Brigade, supported by the 4th Armoured Brigade, took the force containing

THE MEETING AT EL DUDA. On 26th November the Tobruk garrison took El Duda. Next morning, when this picture was taken, tank commanders of Tobruk and the New Zealanders from the frontier joined hands, as was first planned. A corridor now divided the enemy forces.



Bir el Gubi in the rear, punished it heavily and drove it away north-west. Other forces broke up other enemy columns, and heavy attacks on El Duda were repulsed or neutralised by counter-attacks. Next day brought the same tale of successful local actions. Rommel had to give up more ambitious plans, and abandon everything east of a line running from west of Bir el Gubi to south of El Adem.

This meant the real relief of Tobruk. On 7th December, patrols from the garrison, belonging to the Border Regiment and the Queen's Regiment, operating south of El Duda, recovered intact all the guns lost on and December, while other patrols from the XXXth Corps rescued 700 wounded New Zealanders left behind by the enemy in the Divisional field-dressing station. In the course of the day patrols made contact with the King's Dragoon Guards and the 11th Hussars and with the 2nd South African Division, which was advancing along the Bardia-Tobruk road. Two days later forces from Tobruk occupied El Adem and joined up with the 1st South African and 7th Indian Brigades. This cleared the whole of the investment except the western sector, where the enemy continued to hold until pinched out a few days later.

It was now clear that he was in full retreat towards Gazala, and by the 12th, under the cover of costly rearguard actions, he had reached a line stretching south-west from Gazala. This position was not a good one. His right flank was in the air. He had only about 50 tanks left with which to screen it, and he was so closely and strongly pursued that he could not disengage. He therefore stood and fought on this position for five days in what may be called the first battle of Gazala. The British troops fought with undiminished energy, and the outflanking movements carried out by the 7th Armoured Division were particularly successful.

It is not, however, invidious to single out for special praise the 4th Indian Division in the central sector of our assault. On the 13th, their 7th Brigade, with the 25th





UNDER FIRE. Enemy shells rain on the crest of the hill to the right. The armoured cars swerve and halt. One man crouches behind the car, another flattens himself on the desert track. On the slope to the left, the infantry break for cover. The enemy armoured formation cut off at El Duda is blasting its way back to the Axis lines.

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ACROSS THE ROCK AND THORNS OF THE DESERT OUTSIDE TOBRUK INFANTRY ADVANCE THROUG

Field Regiment, repulsed a ferocious counterattack, destroying 16 tanks and taking 370 prisoners. On the 14th, as part of a general attack with the 5th New Zealand Brigade and the Poles on the right, they forced a gap in the enemy's centre and repulsed a vicious counter-attack. On the 15th they completed penetration of the centre of the enemy's line. The 5th Brigade was counter-attacked by every available Axis tank, supported by heavy air cover and a large force of infantry, but they held their ground, and the Divisional Commander in the evening reported that the situation was satisfactory.

So indeed it was. Rommel's lines were both pierced and turned. On the battlefield

he probably had left no more than about 30 tanks, 3,000 vehicles and 35,000 infantry, of whom 20,000 were Italians. An armoured force was on his line of retreat at Tmimi, and another was on its way across the Jebel Akbar to cut the road leading out from Derna. He had very little air support, and was himself subjected to constant air attack.

In later days General Montgomery said that Rommel was a good general, but had a tendency to repeat himself. It was at this moment that he began the tactics, afterwards consistently repeated when he was in a tight place, of saving his Germans at the expense of his unhappy Allies.

During the night of 16th-17th December,



TO ENGAGE IN THE RENEWED FIGHTING AT EL DUDA, FORCING ROMMEL WEST TO GAZALA.

he began to put this decision into effect, and the 7th Armoured Division reported that a huge column escorted by tanks was moving back on Tmimi. The small force there was by-passed and by midday on the 17th this column was approaching Derna. The Italian screen behind them was in full retreat, and the battle had become a pursuit. While the New Zealand 5th Brigade and the Poles pushed on to Tmimi and the 4th Indian Division to Martuba, the 7th Armoured Division and the Guards Brigade Group were making a great effort to intercept the enemy's retreat by striking at Benghazi via Mekili, Charruba and El Abiar.

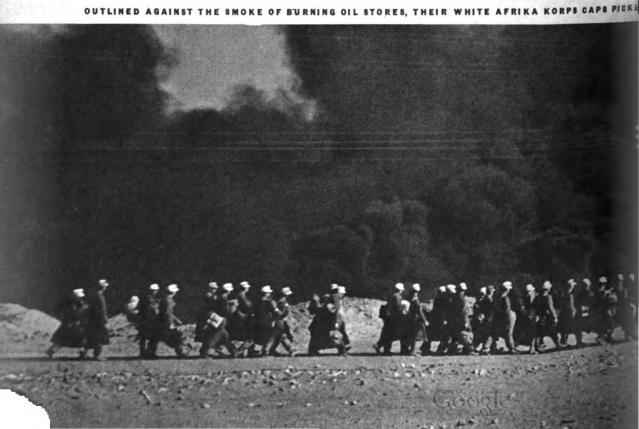
We were all too short of motor transport,

and horrible weather first blinded and then bogged lorries and armour. The enemy, therefore, got most of his men away to the Ajedabia area. But the pursuit had some fruitful exploits. For example, the 11th Sikhs surprised Derna airfields, destroyed over 100 machines, and caught 10 out of 12 big transport planes as they came in unsuspectingly to land. The 6th Rajputana Rifles, after a brilliant cross-country dash, cut off and captured 1,000 of the enemy in The Long Range Desert Giovanni Berta. Group, under the leadership of Lieut .-Colonel (then Captain) David Stirling, and the Middle East Commando carried out two remarkable raids on Sirte and Ajedabia airfields, destroying, in all, 61 machines. But, generally speaking, supply difficulties made it impossible to rub in our victory.

It came within an ace of being rubbed out. Rommel received in the nick of time, on 21st and 22nd December, strong tank reinforcements brought from Tripoli by sea. He proceeded to send away troops no longer battle-worthy and to concentrate those still fit to fight in the Ajedabia area while he organised a counter-stroke. He gave up Benghazi, which was occupied on the afternoon of the 24th December by the Royal Dragoons. But when troops started to close in upon the Ajedabia position, they found the enemy quite as strong as the forces which could be maintained in the forward areas. No discredit, therefore, attaches to the troops who failed to cut off the enemy's main body. On Christmas

Day, the 4th Indian Division was round Benghazi; the 22nd Armoured Brigade, with the 12th Lancers, at Saunu; the Guards Brigade Group in contact with the enemy north and east of Ajedabia; "E" force on his southern flank; part of the 7th Support Group with the 3rd Royal Tank Regiment and the 11th Hussars near Antelat; and the rest of the 7th Support Group near Soluk. These dispositions meant there were practically no infantry near the battlefield, and even the armour was not strong enough for any major attack. The fighting until the end of the year was therefore occasionally very fierce but only local and indecisive.

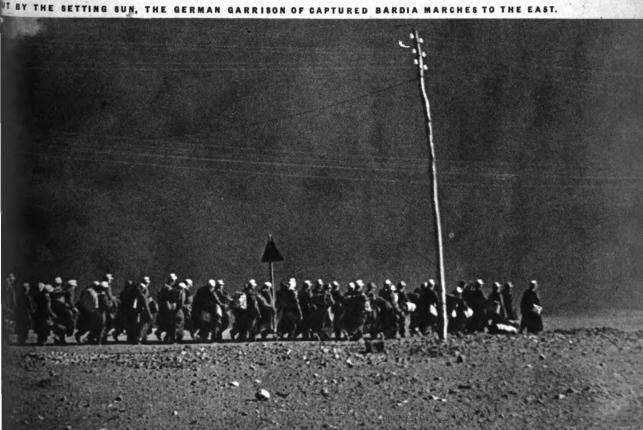
The supply problem was quite enough to explain the Army's lack of strength on the western front and to ensure that it would be weak at least until Benghazi could be made usable. But it was both practicable



and useful to concentrate forces far to the east for the destruction of the garrisons which the enemy had left behind at Bardia, Sollum and Halfaya. While the battle and advance were going on, these garrisons were contained by the 2nd South African Division. Bardia was the first to be seriously attacked on the last day of the year, and on 2nd January the garrison, which included another German General, surrendered unconditionally. Sollum and Halfaya fell ten days later and, at a cost of 500 casualties, the South Africans took about 14,000 prisoners, including 4,000 Germans. The South Africans were helped in this action by the Free French under General de Larminat and by the 1st Army Tank Brigade, who delivered a brilliant attack by moonlight.

On the western front, after our inability to envelop the enemy on 28th-30th December, bad weather and petrol shortage reduced operations to little more than surveillance by patrols. Rommel used this lull to collect and reorganise his forces. But he knew that he could not stay long on the Ajedabia positions. His supply difficulties were just as great as those of the Eighth Army; he lacked adjacent air bases; and as soon as British reinforcements could be got forward to open Benghazi to receive supplies, the Eighth Army should be able to encircle him and prevent the arrival of his reinforcements.

On 5th January he heard of the arrival at Tripoli of nine ships bringing him reinforcements. He knew that other convoys were on the way, and in fact they arrived later in the month, bringing enough Germans and German equipment to make good his losses and to provide him with a new Italian Armoured Division, the 133rd Littorio. The 60th (Sabrata) Italian Division was on its way



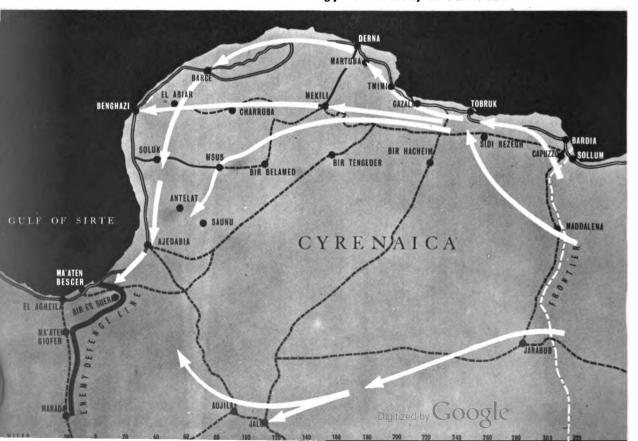
up by land from Tripoli. On 6th January, therefore, he decided to return to his lair at El Agheila, and meet these reinforcements. For the first time he employed on a big scale his subsequently favourite and effective device of covering a retirement with intensive minefields.

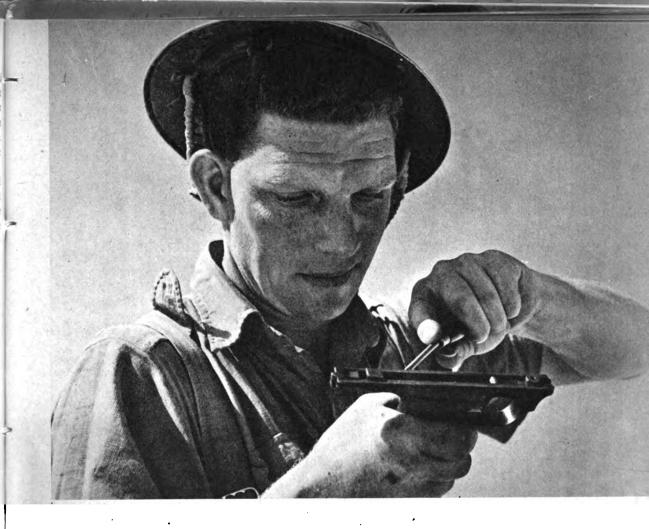
On the 7th the first convoy of British supplies reached Benghazi, but they were too late to reinforce the pursuit, and Rommel reached El Agheila safely after four days of leisurely retreat. It was an extremely strong position. The left flank rested on the sea east of Ma'aten Bescer, which, with its good water supply, was at Rommel's disposal. This position was covered by salt marshes, the roads through which were heavily mined. The line bulged eastwards to include Bir es Suera, and then ran south-west along the hills fringing the north bank of the Wadi el Faregh until,

at Ma'aten Giofer, it turned due south and covered the Marada road to the oasis of that name. The country on its right flank was most difficult and the enemy might well reckon that it would not be turned by any large force. Close behind was the excellent airfield later known as Marble Arch.

These positions were painfully approached by some of the same gallant units as had fought all the way from the Egyptian frontier for the past six weeks. In the north was the Guards Brigade Group, supported by the 11th Hussars. South-east of this group came the 7th Support Group, flanked by the King's Dragoon Guards and the 12th Lancers. Before the enemy counter-attack developed the 7th Support Group had been relieved by the 1st Support Group, but the advanced forces were no thicker on the ground.

ROMMEL'S LAIR AT EL AGHEILA. Fanning out over Cyrenaica, the Auchinleck offensive drives Rommel into his old and strongly defended lair by the Gulf of Sirte.





4. THE LULL AT BAZALA

The enemy's first move forward on 21st January was thought to be only a reconnaissance in force, and the official communiqués rather incautiously said so. If this was his original intention, he quickly changed it on finding that the El Agheila-Ajedabia road was only lightly held by columns of the 200th Guards Brigade. He pushed rapidly through, and seized both Saunu and Antelat on the 22nd. The 2nd Armoured Brigade came down from the north and the 9th Lancers with "E" force up from the south

to attack him there, and after two days' confused fighting he seemed to be checked. The 10th Royal Hussars fought most gallantly against long odds, and knocked out 12 German tanks. A clue to the enemy's real intentions was the discovery on the 23rd of a large convoy off Misurata. It was attacked from the air, and three cargo vessels and two warships out of a total of 24 vessels were hit. Most of the ships, however, got through. Nevertheless, it was still hoped to hold a line from the coast east to Beda

Fomm, Antelat and Saunu. But on the 25th the forces on this line were so roughly handled that they were in no condition to stop the enemy's advance, and it was decided to evacuate Benghazi.

Next day the plan was changed again. The 4th Indian Division was ordered to strike south from the Benghazi area towards Antelat, the 1st Armoured Division to hold on southeast of Charruba and the Polish Brigade to advance to Mekili, while the 4th South African Armoured Car Regiment patrolled between there and Charruba. The 150th Brigade of the 50th Division, now coming up from the east, was to move forward from Bir Hacheim to Bir Tengeder. But again the enemy's strength was miscalculated.

In two days' fighting he cut the 4th Indian Division in two, isolating the 7th Brigade in Benghazi. By a magnificent feat of arms the Brigade, forming itself into three columns, burst through the enemy's lines and joined the armour at Mekili, bringing prisoners taken on the way. They lost much equipment, however, and could not bring the engineer units left in Benghazi for demolition work. There was nothing for it but a further general retreat to a main line of resistance which had been chosen. It was arrived at on 4th February. The 1st South African Brigade, with the Poles and French, held Gazala and the country to the south. Between them and the Trigh el Abd was the armour. The 150th Brigade was at Bir Hacheim, and the 4th Indian Division in reserve at Acroma, where its 5th and 11th Brigades had arrived after gallant rearguard actions by the Camerons and the 5th Mahratta Light Infantry. The Royals with some South African cars patrolled the desert to the south.

The enemy followed up and for the next ten days appeared to be concentrating for a serious attack on the northern sector of this line. By the 14th he had gathered a striking force consisting of most of his Germans in this sector. But the air support on which he had counted was virtually destroyed the same day by a formation of Kittyhawks which

wiped out 20 and probably 30 dive-bombers and fighters in a single action. He continued his deployment and moved forward on 15th February but the attack was not pressed. Temporary equilibrium had been reached and both sides sat back to pile up reinforcements. It was at about this time that General Gott succeeded General Godwin-Austin in command of the XIIIth Corps.

Thus ended General Auchinleck's offensive. It was acclaimed at the time as a victory, for success had been snatched from the jaws of stalemate. Over 36,000 prisoners had been taken, in addition to the infliction of considerable losses in men and material, and the lines finally settled down half-way across Cyrensica instead of on the frontier. If, in retrospect, the results seem to have fallen short of expectations, that was not the fault of the officers and men concerned. Indeed, the swift swing back of the pendulum in the enemy's favour caused an unfair swing over of opinion about the battle.

The Eighth Army has never had full credit for what it achieved by its dogged determination and fine fighting of its officers and men against a better-equipped enemy. No doubt it was hoped that if his armour could be destroyed, his whole Army would be easy meat, but the Eighth Army which advanced to the assault on 18th November was not strong enough for the job. For example, the motor transport, which might have been enough for a short battle, was insufficient for so long and fierce a tussle. The repair and replacement organisation could not be made big enough. When Rommel reached Agheila, all that could be kept in action in the front line was the equivalent of one armoured and one infantry brigade. Even more serious weaknesses were revealed in some of the Army's equipment. The German tanks were better than any to which they were opposed, and the British two-pounder anti-tank gun had not sufficient range or punch. Even the German 50 mm. gun could penetrate tank armour at a range 1,000 yards greater than that of the two-pounder. A quicker rate of fire was no compensation in such open country. In a terrain favouring engagements at short range, it might have been a different story. Despite all this, the Eighth Army did feel itself after the battle to be an Army, and it was this esprit de corps that saved it in the days to come. As an officer wrote at the time, "To be in the Eighth Army is a matter for pride deep beyond casual understanding."

The lull lasted for over three months, until 27th May. Lull is, perhaps, a misleading word. There was one quite considerable operation on 21st March, when several columns carried out raids both near and far to distract the enemy's attention from a vital convoy passing through to Malta. There was as much concealed activity on both sides as in a beehive before the swarm.

Since equilibrium had been reached, the race became one to establish superiority in quality and quantity of supplies, and in this Rommel had a distinct advantage. His types of tanks and guns, notably anti-tank guns, were good enough. His Germans were good and experienced soldiers, and his Italians, contrary to reports far from the battlefield, were by no means negligible. Geographically, his supply lines were short. He had only to get men and supplies across the Mediterranean to Benghazi or Tripoli, to be able to wheel them up to the front. His main task, therefore, was to neutralise Malta as a focus of interruption. That is why, all through the spring, huge Axis air forces based on Sicily pounded the island without respite. The defence was beyond praise, but there could be no effective offensive either by sea or air. From R.A.F. airfields behind the Gazala lines, it was much more difficult, because of the distances involved, to organise interruption of the enemy's sea lanes by air attack. Naval bases were also too distant. For all these reasons and despite the continuous depredations of the Navy's submarines, Rommel was able to get supplies through.

The problems facing the British were much more complicated. Every man and every scrap of material, apart from what the trans-

African air route could carry, had to be sent 12,000 miles by sea round the Cape. A tank had to be found to match the German Mark III and as yet no such tank was being produced in quantity. The Americans, however, who were making General Grant tanks started sending them over. They were good tanks, but their big guns had a limited traverse, and it was a distinct achievement for their crews to match, as they did, the German armour. Moreover, there were not enough Grants by the time the real battle opened. As for guns, there was nothing to say against the 25-pounder field gun, except possibly that too few of them were self-propelled. But a bigger anti-tank gun was needed. The Germans had solved this problem by using an 88 mm. gun, originally designed as an anti-aircraft weapon. The projected answer to this was the sixpounder anti-tank gun. Large quantities of them were on the way, but very few were actually in the battle line by the end of May; and there had not been time to complete the training of all crews in their use. As for the air, reinforcement in machines by the trans-African route was easier, and cooperation with the ground forces had been worked out in detail, but for all the tasks required of it, the R.A.F. was still perilously weak in aircraft.

It must not be forgotten that during this lull there was a drain away from, as well as a feed pipe into, the pool of men and supplies. The Japanese offensive was in full blast. Apart from all that was diverted from the Middle East to the Far East, many troops, including a complete Armoured Brigade, were sent from the Middle East to Ceylon, India and Burma; and all the Australians except some H.Q. and base units and one Division (not with the Eighth Army until later) had had to return to ward off what seemed like an imminent invasion of Australia itself. Though the Eighth Army could expect and did gradually receive large reinforcements from home and the United States, it was always likely that Rommel would be ready to attack first. This proved to be the case.



ROMMEL STRIKES FOR SUEZ

5. DISASTER AT KNIGHTSBRIDGE

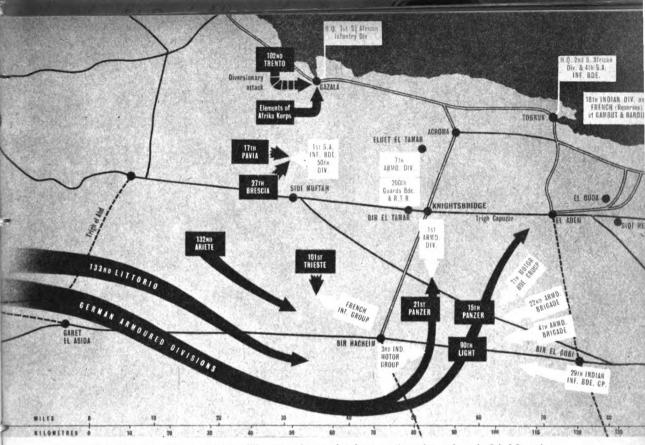
Early in May the enemy started to work forward and narrow no-man's-land. The enemy High Command was also reorganised, General Nehring arriving to take command of the Afrika Korps, and General von Bismarck being appointed to command the 21st Armoured Division. These facts pointed to the arrival of large reinforcements. An attack was clearly imminent, and it seemed pretty certain that its first objective would be Tobruk.

Rommel's attack on 27th May was dictated by his knowledge that the longer he waited the weaker, relatively speaking, he would become. He chose the moment in the race for supplies at which he was the strongest. The British High Command was, of course, perfectly aware that the attack was impending. They correctly anticipated that Rommel's first main objective would be Tohruk, because the garrison left there after Wavell's retreat had seriously inconvenienced him. It was uncertain, however, whether he would thrust directly at Tobruk or not. The Eighth Army's dispositions seemed to be based largely on the assumption that he would; and its infantry reserves, the 5th Indian Division with some of the Free French, were stationed at Gambut and Bardia. The 200th Guards Brigade and the 32nd Army Tank Brigade were also brought up from Cairo to the northern sector of the front. In the line were the 1st South African Division, with a Brigade of the 2nd South African Division in close reserve, and the 50th Division, with the 150th Infantry Brigade which detached to hold a strong-point farther south at Sidi Muftah. On the extreme southern flank Bir Hacheim was held by a French garrison assisted by some of the 3rd Indian Motor Brigade, which, however, arrived only two days before the battle. In view of the gallantry of this

garrison, which sowed the seeds of French military revival, its composition should be stated. It consisted of the Bataillon du Pacifique, two battalions of the Foreign Legion, and some French marines, the whole under the command of General Koenig with General Cazaud as his second-in-command.

The defence was by no means a continuous line. It consisted of a number of irregularly spaced strong-points or "boxes," linked by deep minefields. These boxes were not confined to any one alignment. Those nearest the enemy were held by infantry garrisons; those farther back served not only as reserve static positions, but also as areas round and from which the armour could operate to engage any enemy which passed the forward bases and minefields. Most of the armour was, in fact, placed behind the northern sector, and the chief box was round a junction of tracks known as Knightsbridge, about 17 miles west of El Adem.

Knightsbridge was the key to the Gazala position and had been chosen as such because. so long as it was held, the enemy could win no strategic success. If he were to break through the centre by a frontal attack, Knightsbridge lay directly in his path; and he must either be destroyed on the spot or shepherded away northwards by the armour. In that case he would run on to the Acroma box and the armour in that area. If he effected a breakthrough farther north, the right flank of his advance would come under destructive fire from the ridge north of Knightsbridge. If he came round south he could be attacked on his left flank, and his own communications could be cut. Lastly, Knightsbridge commanded all the tracks by which supplies came up to the front. If it were to fall, the whole line from Sidi Muftah to Bir Hacheim would be untenable. This key position was entrusted



THE BATTLE OF KNIGHTSBRIDGE. The map shows what happened on the 27th and 28th May, the first and second days of Rommel's big offensive. Rommel had hoped by this time to have taken Bir Hacheim and reached the coast east of Tobruk. He was checked by the British armour at Knightsbridge.

to the Guards Brigade and the R.H.A. Throughout the battle it was the pivot on and around which the armour manœuvred.

This armour consisted of the 7th Armoured Division, which had earned the proud title of the "Desert Rats," thanks to its scurrying and biting proclivities. At this moment it consisted of the 3rd and 5th Royal Tank Regiments, the 8th Hussars, the 7th Motorised Brigade, two battalions of the 60th and one battalion of the Rifle Brigade. This Division had relieved the 1st Armoured Division in the forward areas about a month before the battle opened; but the latter had been re-equipped and brought back into the line, so that it was available in addition to the smaller armoured formations already mentioned. It consisted of the 2nd and 22nd Armoured Brigades and the 200th Guards

Brigade. The two Armoured Divisions, together with an armoured car screen of the 12th Lancers, the King's Dragoon Guards, the 4th South African Armoured Car Regiment, and the Bir Hacheim garrison, composed the XXXth Corps. The infantry, in line together with the 1st and 32nd Army Tank Brigades, formed the XIIIth Corps. The two remaining Brigades of the 2nd South African Division held Tobruk. With these dispositions, the Eighth Army, while itself getting ready to attack, awaited any attack by the enemy with great confidence.

Rommel's object was to capture Tobruk in a 24-hour rush. To achieve it he planned to secure air superiority and, under cover of his air force, pass the whole of his German armour (less one battalion), and about half the Italian armour with some infantry support, round the south of the line. He hoped to capture Bir Hacheim on the way, and occupy the Eighth Army's advanced fuelling stations and airfields at Acroma, El Adem, El Duda, Sidi Rezegh and Gambut on the first day, thus encircling Tobruk.

On the second day all his armour was to drive from the east against the rear of the Gazala positions, while his Italian infantry was to deliver a frontal attack from the west. This would crush the British infantry to powder. On the next night Tobruk was to be attacked by the whole Axis Army, and was to fall on 30th May. There is some reason to think that Rommel was expecting the help of forces from Crete in the attack on Tobruk.

This plan completely miscarried. Early on the 27th, part of the Ariete Division

attacked Bir Hacheim but was repulsed with the loss of 48 tanks. The rest of the enemy's main column, after making a wide detour during the night, struck north behind Bir Hacheim at daylight. The 3rd Indian Motor Brigade first met the rush but could not hope to hold two armoured divisions in the open field. Nevertheless it exacted a toll of more than 50 tanks before being finally overrun. The 21st German Armoured Division then made for Acroma, but was met and held by our 1st Armoured Division pivoting on the Knightsbridge box. The 15th German Armoured Division made for El Adem itself, detaching fractions to seize El Duda and Sidi Rezegh. All these parties were met and driven back by the 22nd and 4th Armoured Brigades, whose

MOTORISED INFANTRY MOVE FORWARD INTO THE KNIGHTSBRIDGE BATTLE. THE CONVOYS ARE



units, notably the Royal Gloucestershire Hussars, the 3rd County of London Yeomanry, the 8th Hussars and the 3rd Royal Tank Regiment, were the first to meet the full onslaught of the German armour. The feint attack on Gazala from the west took place as scheduled, but was, of course, not pressed.

This complete check was not the end of Rommel's troubles. The R.A.F. had refused to be mastered, and had given his motor transport a very bad time. They were certainly capable, in conjunction with the Navy, of frustrating any invasion from Crete which may have been arranged. Rommel's columns were only carrying supplies for five or six days, and before that period expired he would have to renew them somehow or meet with disaster.

SCATTERED AGAINST DIVE-BOMBING ATTACK.



Here is the proper place to interpolate the remarkable story of the experiences of General Messervy, Commander of the 7th Armoured Division. In the first series of armoured clashes on 27th May, the General had held on to his original H.Q. just a little too long, in the very proper desire not to lose touch with his units for a moment. As the H.Q. party moved off, they were overtaken by a German Battle Group, and after fighting until their weapons were silenced and their cars on fire, they surrendered — temporarily. The surviving officers were wearing only shorts and shirts without rank badges; and the General, who was determined from the very first moment to escape, managed to tear off his badges before yielding. The prisoners were all bundled into the back of a lorry, and the Germans pushed on. Soon they ran into a group of the General's own Division, which gave battle. After the first dash there was a lull, and the General took his wounded Staff Captain to a German doctor for attention. He was alarmed to see that the doctor looked at him curiously.

"You look an old man to be serving in the desert," said the German.

"I am no longer a boy," replied the General nonchalantly, "but I'm a good fatigue man."

"You must be older than I am," pursued the doctor, "and I am thirty-five."

"Yes, yes," said the General, who was nearly fifty, "just a year or two older." Fortunately at that moment the battle broke out again and ended this embarrassing conversation. The Germans moved on and General Messervy and two of his officers were alone in a lorry driver by a young German officer, who had improvidently left a hammer lying on the back seat. It can be imagined how fingers itched and eyes travelled from hammer to head. But after a hurried consultation, in which an officer got well cursed for calling the General by his rank, it was decided to wait until dark.

But before this another chance came.

The British attacked again, and in the confusion the party managed to nip out of the lorry and scoot for an old gun emplacement about 400 yards away. Yells and threats followed them, but the Germans were too busy with the battle to pursue, and the party burrowed under an old tarpaulin in the emplacement. They soon had evidence that it was already tenanted by a native South African pioneer, also intent on escape. For three hours until it was dark they crouched in growing hope and discomfort. Finally, they knew their original captors had given them up. They crept out, found some water, and set off on an arduous walk towards where they thought the British troops might be found. They crept through several enemy parties, but just before dawn, after 16 miles of it, a Scottish voice challenged them and they knew they were safe. Thus, after an interval of only some 18 hours, the 7th Armoured Division had a staff again, including the wounded Staff Captain, who had got away later, though unable to take part in the sprint.

This was the spirit which helped to put the enemy in the predicament in which he found himself on 28th May.

His only chance of avoiding an ignominious scuttle back the way he had come was to make gaps through the British minefields by which he could pass supplies from west to east and, if necessary, retire from east to west. On the 28th he did succeed in clearing two channels, one near the Trigh el Abd and the other near the Trigh Capuzzo, just north of the box held by the 150th Infantry Brigade. These gaps he protected by heavy screens of anti-tank guns. His first intention seems to have been to use these tenuous life-lines for a withdrawal. The great armoured battle which raged for the next four days in the Knightsbridge area seemed designed to extricate his armour from their unenviable isolation east of our lines.

The 29th May was a day of most desperate fighting, with heavy tank casualties on both sides. But there were moments on the

following days when the Eighth Army seemed to be on the brink of complete victory. It became evident that the Grant tank was a much better match than its predecessors for the Mark III, though it was really not until the Sherman reached the Eighth Army six months later that there was full armoured equality.

As time went on, apart from battle casualties, much of the enemy's motor transport seemed to be immobilised for want of petrol, and on the 30th a French "Jock" column sallying from Bir Hacheim and joining up with British columns, destroyed 25 tanks also stuck for this reason. The 4th Armoured Brigade, which provided these columns, went on to do tremendous damage to the enemy's lines of communication. It was, however, disquieting that the gaps were still open, and on 1st June they became a wide gash. After being heavily attacked from several sides for 36 hours, the 150th Infantry Brigade holding the Sidi Muftah ridge was overwhelmed, and a gap ten miles wide was open through the British lines.

It was still expected, according to intelligence reports from different quarters, that Rommel would withdraw, though neither the Commanders on the spot nor the C.-in-C. shared this opinion. They were right. He called up from the west the whole of his reserves, which had been facing the Gazala lines, and made another bid for victory. As a preliminary move, he concentrated the bulk of his armour and the Italian 20th Corps in a bulge east of his corridor and south of the positions held by the 50th Division. But he dared not launch a full-scale attack until he had eliminated the bastion of Bir Hacheim to his south. The second phase of the battle, therefore, was marked by a twofold effort on our part, first to hold Bir Hacheim, and second to puncture the bulge by counter-attacks.

The British High Command had earlier planned a diversionary offensive from the northern sector west and south-west. But the fighting in the Knightsbridge area was too



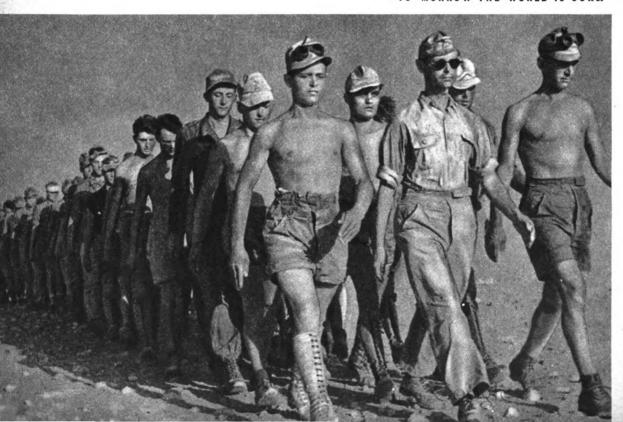
GREAT ARMOURED BATTLES raged around Knightsbridge for the four days following 28th May with the issue still uncertain. These battlefield scenes show British troops searching a destroyed German tank, and, below, ambulance men with a wounded anti-tank gunner.





THE MAN FROM ITALY.

"TO-MORROW THE WORLD IS OURS."



absorbing; here the 2nd Royal Horse Artillery and the Coldstream Guards were under continuous fire from 17 enemy batteries at the same time. This, and then the loss of Sidi Muftah, caused the plan to be called off.

Bir Hacheim held magnificently, All through 2nd June it was assailed from the north and east by the whole of the 101st (Trieste) Division, parts of the 17th and 27th Divisions and over 50 tanks. The French garrison repulsed all attacks. They were helped by forces operating in the enemy's rear, notably the 7th Motorised Brigade. On the 3rd the attacks were renewed, strongly supported by German tanks and dive-bombers, but with no better success. On this day, in an engagement near Tamar, the 1st Royal Horse Artillery put up a fine show, knocking out 17 German tanks. But this fighting in the north did not check the attack on Bir Hacheim. The 4th June witnessed the same story, and the R.A.F. during these three critical days destroyed 30 machines including most of the dive-bombers available. The garrison was greatly heartened by this air support and wirelessed their thanks. They received from Air-Marshal Coningham the reply, " Merci pour le sport ".

They had indeed achieved much more than a local defensive victory. To support his attack, the enemy had been obliged to thin out his forces west of Gazala, and the divisions there (the 1st South African and two remaining Brigades of the 50th) were correspondingly more free to take the offensive. The enemy, on the other hand, found his forces becoming gradually more tied up, and he was further than ever from being able to resume his advance towards Tobruk. An attempt to break through towards Tobruk would need the whole of his armour, and his infantry would be left at the mercy of surrounding forces to the north, west and south. Retreat had become All his armour and almost as difficult. artillery would be needed as a rearguard, and his infantry and supply columns would have to run the gauntlet of British columns in no-man's-land. In short, the initiative seemed to be fluttering over to the Eighth Army.

The time had come for a furious counterattack. It might even be passing if Rommel was massing for a renewed assault (as in fact he was) and not for withdrawal. Three alternatives were considered by General Ritchie. He might launch the 1st South African Division and the 50th Division west from their positions and then south across the enemy's rear. He might send the 5th Indian Division with some armour in a wide sweep south of Bir Hacheim and round to take the assailants of that position in the rear. Lastly, he might attack the German bulge itself from several sides simultaneously and pinch it out. The third course was finally chosen and to someparticularly in the 50th Division—it must have borne a sinister analogy to the "Wevgand plan" in the Battle of France.

General Ritchie's plan did at least ma-On the night of 4th-5th June two battalions of the 50th Division, supported by the 32nd Tank Brigade, attacked from the north, and two brigades of the 5th Indian Division, supported by the 22nd Brigade and four regiments of artillery, from the east. The northern attack failed. Its infantry was broken up by artillery before it got under way and its tanks ran first on to an uncharted minefield and then on to a line of German tanks and guns. The attack from the east got some way forward to Bir el Tamar, but was there held up, heavily counter-attacked next day and practically wiped out. All the artillery was lost, including the 107th Royal Horse Artillery, which fought its guns until hardly an officer or man survived. The Highland Light Infantry and the 10th Baluch Regiment here also fought to the last man.

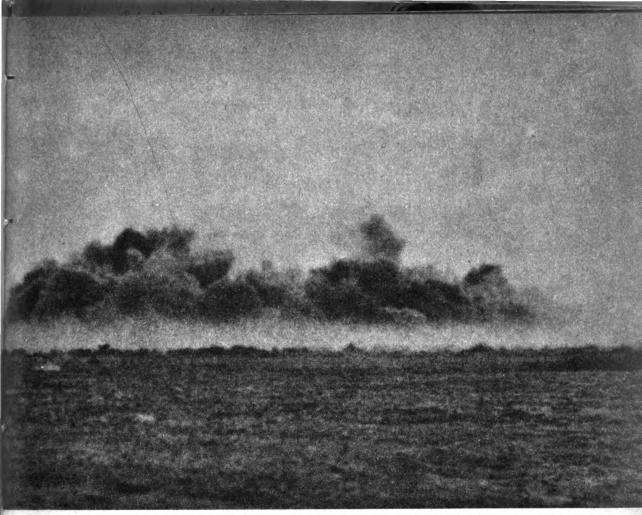
June 5th and 6th were altogether unhappy days, and the failure of the attack was the beginning of a more general defeat. Rommel had undoubtedly scored a defensive victory. He had held his bulge virtually intact, and he was not even forced to slacken the assault



THIS IS THE CAULDRON. BENEATH ITS PALL OF SMOKE THE EIGHTH ARMY IS BEGINNING TO

on Bir Hacheim. This place was heavily attacked on the 6th, 7th and 8th and, though local inroads were successfully corrected by counter-attacks, it was clear that the garrison was getting into difficulties. Up to 9th June occasional convoys had reached them overland, and they were never without the help of the R.A.F. and of columns operating from outside; but on that day it was found necessary to drop supplies by air.

Thirty-six hours later, during the night of 10th-11th June, lack of supplies and sheer physical exhaustion of the garrison dictated its withdrawal. General Ritchie, therefore, ordered them to evacuate the place. Helped by the 7th Motorised Brigade, the vanguard of 2,000 men got away to the east without interference. The rearguard, which was trying to bring out its guns, was intercepted; but about 1,000 men managed to fight their way through to safety. The story that General Koenig was driven out in a car by an English girl is perfectly true. She was Miss Susan Travers. Her car had 11 bullet holes in it by the time it reached safety. The withdrawal was recognised on



LOSE THE GREAT KNIGHTSBRIDGE TANK BATTLE. THE CRITICAL COUNTER-ATTACK HAS FAILED.

both sides as the turning-point of the battle. It marked the failure of the Eighth Army's counter-offensive and lost it the initiative. The enemy could and did at once unite his forces and move north to Acroma, thus cutting the Eighth Army in two. From this point superiority in quality of armoured equipment could be made to tell, and could not be countered by the small number of General Grants available.

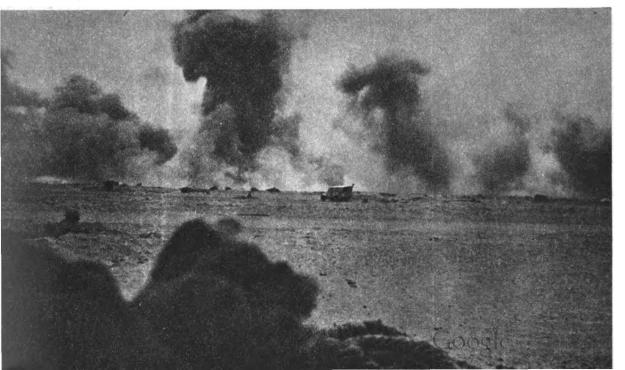
During the next two days the enemy rapidly concentrated his forces in the Acroma-El Adem area, though this advance north of his units from Bir Hacheim was most gallantly contested by the 2nd, 4th and 22nd Armoured Brigades, all much reduced in strength. He had received the reinforcement of the 133rd Italian Littorio (Armoured) Division, and this had again brought the tank strength of both sides to numerical equality. There was an imminent danger that the British garrisons scattered in various boxes would be destroyed piecemeal. On the night of 13th-14th June, therefore, the Gazala divisions were ordered to withdraw. The South Africans got out safely due east,

under cover of the determined resistance of the armoured Divisions at Eluet el Tamar and Acroma, and reached Tobruk. To provide this cover, the 8th Royal Tank Regiment, the Bays, the 4th County of London Yeomanry and the 22nd Armoured Brigade fought magnificently. The 50th Division had a more difficult job, because they had to start from farther south after the South Africans had withdrawn. They cut their way out due west through the Italian infantry, swung south and, after a detour round Bir Hacheim, reached Maddalena late on the 15th. Meanwhile, however, the armoured clashes continued to go badly.

At the time, the impression became current that 13th June was the fatal day for the British armour. It was certainly a bad period, but subsequent information shows that it was no worse than several other days and not so bad as some; and that both before and after this date the Eighth Army suffered severely without being able to inflict comparable casualties on the enemy. This attrition

was the inevitable consequence of trying to fight tank-to-tank battles on ground where the heavier and more powerfully equipped German tanks and anti-tank guns could make their superiority in hitting power tell. Probably the origin of the story of 13th June being the blackest day was that, early on the 14th, Knightsbridge, so gallantly held by the 200th Guards Brigade, had to be But it is worth noting that evacuated. under all the handicaps now revealed, they had held up the enemy there for a full fortnight, and it would not be fair to allow this fine resistance to be obscured by the shadow of its ultimate defeat. The Guards actually got everything out of Knightsbridge except two guns. After this, our isolated boxes were lost one after another. The 12th Frontier Force Regiment was overrun. The Worcesters, after a defence worthy of their reputation, managed to retire into Tobruk. El Adem was only abandoned after the 6th Rajputana Rifles had actually once recovered it in a counter-attack.

NEARING THE END AT BIR HACHEIM. A heavy dive-bombing attack is scourging Bir Hacheim. Exhausted and lacking supplies, the garrison was ordered to withdraw during the night of 10th-11th June.



6. THE FALL OF TOBRUK: THE FRONTIER CROSSED

General Auchinleck had already made up his mind to do as Rommel had done at Ajedabia, namely, withdraw to a more distant line and meet the reinforcements that were on the way to him. The losses suffered by our armour had forced him to give up all advanced posts except Tobruk; that fortress remained. Its defence in the previous year had meant a heavy cost in ships, and the Royal Navy could not again undertake the task of revictualling the garrison; but this time supplies for three months were already stored there and, although the fortress could be isolated, the isolation would be only temporary.

The troops on the frontier were to be reinforced, and a striking force built up behind the screen which should, in the near future, advance westwards again and join with the Tobruk garrison in clearing the enemy out of Cyrenaica. There was not much time to organise the defences, but these had proved impregnable before, and it was reasonable to suppose that Rommel would have too large a part of his forces engaged in moving forward to the frontier to be able to stage an attack in force upon Tobruk for some little while at least. That expectation was to be falsified by events.

The morale of the Army was unaffected by the adverse turn of the battle. All through the next five days local and successful actions were fought by our retiring troops against the advancing enemy. Those units that had not been detailed to defend Tobruk or to delay the advance were got safely over the frontier, though the South Wales Borderers and the 18th Royal Garhwal Rifles, acting as rearguard to two Indian Brigades, and the 2nd Fighting French Brigade were intercepted and roughly handled by one of the enemy's main columns on the Trigh

Capuzzo. His other main line of advance was along the track from El Adem to Bir Sheferzen. When they had made sure that the forces on the frontier were in no shape to give serious trouble, both these columns turned and made for Tobruk from the west.

In that fortress was now concentrated a garrison which appeared strong, but certainly not too strong to defend a perimeter of 25 miles with which half the troops and most of the artillery were unfamiliar. Besides two Brigades of the 2nd South African Division, there were the 11th Indian Infantry Brigade, the Guards Brigade, and the 32nd Army Tank Brigade. The 7th Motorised Brigade, the 6th Royal Tank Regiment, and all remaining tanks of the 2nd and 22nd Armoured Brigades had been in the neighbourhood, covering the retreat to the frontier. This small force. after a fierce battle with the whole of the enemy's armour, was driven off eastwards and was therefore unable to come to the help of Tobruk.

Early on 20th June a heavy artillery barrage was opened on the El Duda sector of the perimeter which was held by the 7th Gurkha Rifles, Mahrattas, and Cameron Highlanders. The shelling was followed by heavy bombing, which helped to blow up the protective minefields, and then was directed against the posts held by the Mahrattas. No air protection could be provided against this bombing because the R.A.F. had at last been forced to retire to airfields beyond effective fighter range. Enemy sappers then filled in a narrow stretch of the anti-tank ditch. Over this bridge an assault was led by two companies of the German ooth Light Division, followed by a large force of tanks. with Italian infantry in support. lanche overwhelmed the Mahrattas. tanks swept on, some to run amok in the town,





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some to spread out fanwise and take other sectors of the defences in the rear. The British tanks counter-attacked and inflicted some casualties, but late in the afternoon not a single one was left in action. About 8 o'clock in the evening the South African headquarters were surrounded, but the infantry on the perimeter, including the remains of the gallant 11th Indian Brigade, were still fighting on.

As in the case of the comparable disaster of Singapore, it is difficult to disentangle the sequence of events from the terrible confusion inevitable in a breached but battling fortress. During the night of the 20th-21st Major-General Klopper, commanding the South Africans, who was the senior officer in Tobruk, received but did not succeed in transmitting to all units the order to fight their way out if

they could, and, if not, to resist to the last. At 7 o'clock next morning the enemy demanded surrender. No doubt continued resistance appeared hopeless, and about 9.30 units received the order to burn all transport and capitulate. The order did not reach everybody in the prevailing confusion. Over 200 officers and men of the Coldstream Guards, some 200 South Africans, and 40 artillerymen got away; and some groups on the south-eastern sector continued fighting until the afternoon. But about 25,000 men laid down their arms. Thus the Eighth Army in a few hours had lost a large part of its infantry effectives and of its remaining tanks.

It is only fair to recall that during the earlier eight months' siege of Tobruk there had been but one serious attack with tanks, and that had been delivered against the Medawwa salient,

RETREAT TOWARDS SUEZ. The guns and the men go back as the victorious Afrika Korps drives fast behind them. Tobruk and the whole frontier position have fallen.



where alone the defences were in depth. Therefore no comparison can justly be made between holding Tobruk then and losing it now.

Nevertheless, of all the reverses ever suffered by the British arms, few have caused a greater shock than the fall of Tobruk. It was quite unexpected and appeared inexplicable to all who were not there. The former siege had invested the name of Tobruk with special glamour. The Gazala battle had opened so well, and for a fortnight there had been hints and hopes of victory, which were now completely dashed. This was clearly something much more serious than the swing of the pendulum in Wavell's time. The Prime Minister knew it when the news reached him in the White House where he was visiting President Roosevelt. When handed the black telegram, his only remark was the magnificent under-statement: "Rather disconcerting." But he has since revealed that he was in fact "the most miserable Englishman in America since Burgoyne surrendered at Saratoga".

He has himself described the immediate and generous reaction of his host in earmarking all the first batch of Sherman tanks for the Middle East. The humblest worker in the British factories knew it, and asked himself or herself whether the cream of munitions effort since Dunkirk had been spilt. The Axis knew it and exulted; while every quisling found new cause to mask his shame in this evidence of German invincibility. Above all, the Eighth Army knew it. Here is the reaction of one of its officers who heard the news on the wireless while returning in a troopship from England to the Middle East:

"There is a cold hand on my heart. I feel sick and utterly miserable. Tobruk has fallen. Gone! It is hard to believe. I've had the wireless sets frantically searching the air for more and more details; but they are not to be had. All we know is that Rommel penetrated the defences yesterday and that the show there is over now. A

tenseness is creeping into the atmosphere abroad. There are questions, questions, questions—all day long. . . . It is a frightful blow."

Perhaps the worst part of the blow was the enemy's capture of enormous supplies. Tobruk had been used as the main base for the offensive that was being planned from the Gazala positions. The main petrol dump had been burned, but mountains of food, pyramids of shells, masses of other stores fell almost intact into the enemy's hands.

Not the least of the proofs of the Eighth Army's quality is that it rose superior to this trial. But it was not a question of gaining a few weeks for a rally. The difficulty about this Middle East campaign was that at least four months had to elapse between the decision to dispatch this or that reinforcement, either from Britain or from the United States, and its arrival. Mercifully the flow of men and materials had been started long before the disaster. The 44th and 51st Divisions had left England in the last week of May and the first week of June. Many hundreds of six-pounder guns were already on the way, together with numbers of new tanks. The High Command could also scrape up from other parts of the Middle East certain reinforcements, notably the 9th Australian Division, the 2nd New Zealand Division, the 18th Indian Infantry Brigade and some armoured elements. But the big stuff -two British Divisions, and the American tanks and self-propelled guns—could not be expected before late July or early August. It was going to be a near thing.

The loss of Tobruk and of so many men and so much of the small British armoured strength, meant that the frontier position on which it had been proposed to make a stand was untenable. It was too easily outflanked to be held by infantry lacking a strong mobile reserve. Therefore the order was given to fall back 125 miles eastwards to Matruh, only a delaying force being left in the Sollum area, so as to afford time for the withdrawal of the main body. But at the same time the Commander-

in-Chief decided that Matruh also was indefensible; it had been designed for infantry supported by armour operating on its southern flank, and without such cover it might well prove to be nothing but a trap. But it was a good place at which to fight a rearguard action. So from the frontier the troops were recalled to Matruh.

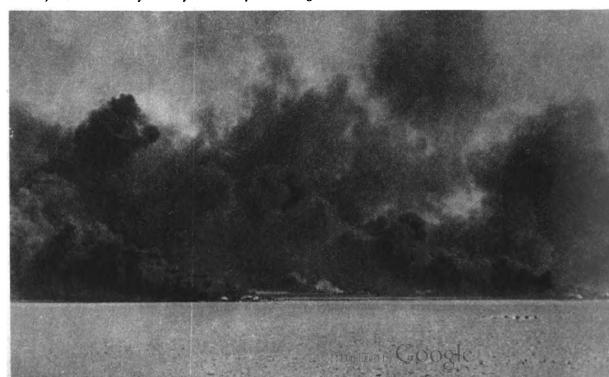
Rommel determined to strike while the going appeared good, and to use his whole available force against one position at Matruh. In taking this decision he overruled Mussolini and some of his own staff, who thought a halt should be made on the frontier until reinforcements were received. He therefore pressed on in parallel columns along the coast road, along the railway, along the edge of the escarpment and farther south towards Bir Kenayia. In the van were his two German Armoured Divisions and the Ariete Division, with the newly arrived 133rd Littorio Italian Armoured Division, the 90th Light Division and the 102nd Italian Motorised Division

following up. Two days after the fall of Tobruk he had added to these forces four full Italian infantry divisions.

Facing him was an advanced screen consisting of the 7th Motorised Brigade, the 3rd Indian Motorised Brigade and an improvised armoured car brigade (the 12th Lancers, the Royals and the King's Dragoon Guards; a battalion of the King's Royal Rifle Corps and the 29th Indian Infantry Brigade. Behind them in Mersa Matruh were an Indian Division and the 50th Division (the 69th, 151st and 1st South African Brigades). Farther south were the 5th Indian Division, the 2nd New Zealand Division of three Brigades, and an improvised armoured car brigade consisting of remains of the 4th and 22nd Armoured Brigades. The odds against this combined force were very heavy, and if commanders or men had quailed it would have been all up.

They did not quail. General Auchinleck decided, after it became clear that Matruh

SET ABLAZE by the retreating Eighth Army, the accumulated stores of Thalatha, railhead of the branch line from Sidi Barrani, blot out the sky as they burn away to nothing.



could not be held, to stand at El Alamein, where the Oattara Depression would protect his left flank and the sea his right. Here. during the summer, he had had the skeleton of prepared positions constructed, and now reaped the reward of foresight, assisted by the skill and energy which General Willoughby Norrie and the XXXth Corps put into the job of improving the defences. Moreover, he intended to do the enemy as much damage as possible on the way back. The hour was critical, however, and he decided to take on his own shoulders direct responsibility for operations. On 25th June, therefore, he took over from General Ritchie the conduct of the battle.

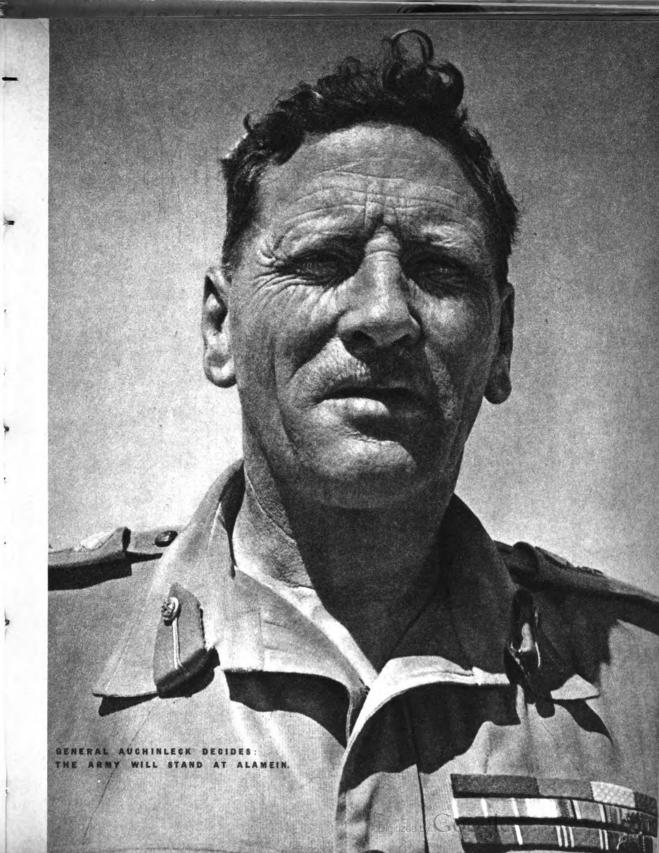
By the 26th Rommel had concentrated his main forces in the middle of what may be called the Matruh positions. His German divisions were 18 miles south-west of Matruh village, his Italian armour east and west of the Matruh-Siwa track, and his Italian infantry on the coast road west of Matruh. These dispositions resembled those in the

early stages of the Gazala battle, except that the enemy had reached the middle of the position by direct penetration. He clearly hoped for a second Tobruk at Matruh. On 27th June, therefore, while the Italians closed in from the west, the Germans continued to by-pass Matruh, and collected in the Mingar Qa'aim area, where they were well placed to strike north and take some of the British forces in the rear. Next day they tried this manœuvre. The New Zealanders were furiously attacked five times, but vielded not an inch either to tanks or infantry. After nightfall they fixed bayonets and charged out eastwards through the enemy, reaching Alamein on the evening of the 20th after a magnificent feat of arms. They were greatly helped by the Bays, who reached the front after re-equipping in time to render essential Three Indian Brigades also broke out with equal gallantry, the Essex and 10th Baluch Regiments and the 6th Rajputana Rifles fighting their way back through four enemy divisions.

7. THE LAST DITCH

The enemy's best chance now was to attack before the Eighth Army could settle down after its long and difficult retreat and before reinforcements could come up. He therefore pressed on furiously all through the 29th and 30th and arrived in front of the El Alamein positions early in the afternoon of the 30th. Next day his 90th Light Division, supported by the Trento Division and 20 tanks, repeatedly attacked the South Africans' sector. In spite of dive-bombing, all these attacks were repulsed. To the south the position at Bir el Shein, held by the 18th Indian Infantry Brigade, was subject to a similar ordeal. During the day all assaults were repulsed or neutralised by counter-attack; but in the night the positions were overwhelmed in a renewed attack and a gap was opened in the British lines.

The next three days were extremely critical. On 2nd July, in an attempt to enlarge the gap, Rommel flung the 90th Division, most of his Italian infantry, and three armoured divisions at the 1st Armoured Division and South Africans. The battle ebbed and flowed throughout the day, and the 1st Armoured Division received the special congratulations of General Auchinleck for its superb work. At one moment the enemy certainly thought they were through and issued a communiqué about pursuing the beaten British towards Alexandria. Like Molas's first dispatch from



Marengo, these shouts of victory were premature. Emulating the charges of Desaix and Kellerman, which snatched victory from the jaws of defeat, the 4th and 22nd Armoured Brigades, advancing west and north, counterattacked the enemy's flank, while the New Zealanders with the 7th Motorised Brigade engaged 40 of his tanks. The South Africans in their turn went over from defence to attack, and by the evening the enemy had to withdraw, leaving all the British positions intact.

Next day Rommel tried again. This time the New Zealanders north-west of Bab el Qattara sustained the main shock in the morning, and the 1st Armoured Division met the other main thrust against a ridge ten miles south of Alamein station in the afternoon. The enemy was everywhere repulsed, and lost during the day 21 tanks, 44 guns, 400 prisoners and 16 Stukas. It was the turn of the tide, and the C.-in-C.'s purpose of regaining the initiative had been achieved. From that moment the vision of a triumphal entry into Alexandria faded. The victors of Gazala were more exhausted than the vanquished. They were thrown back by wearied troops, who, in spite of bewilderment at their earlier defeat, had found the strength to hold the last ditch.

This is primarily the story of the Eighth Army, and no attempt has been made to describe the doings of the R.A.F. There is not the slightest doubt that but for its magnificent achievements the Army would never have been extricated at all. When things were going back so rapidly, squadrons would have to take off from one airfield and alight on another far to the rear because during the few hours of their sortie their original landing place had gone. "During the whole of that long and awful retreat," writes an Army officer, "nobody even bothered to look up when aircraft were heard, such was the certainty that they were our own machines."

Thus the Eighth Army survived its darkest hour. Including the losses at Tobruk, it had lost some 80,000 men in battle and was still unbroken. On the contrary, with the help of reinforcements which were now moving up rapidly and in strength, it proceeded to break the enemy.

A symptom of the change occurred when fighting was resumed on 4th July. About 600 German infantry offered to surrender to the 1st Armoured Division. A British officer dismounted from his tank to receive them but both he and they were heavily fired on by their friends behind, and all but about 60 were killed. In this sector—south of Alamein railway station—the enemy were also heavily attacked from the air, and by the afternoon were in full retreat. Farther south, the XIIIth Corps drove in the enemy's right flank, and by early next morning the 5th New Zealand Brigade had cleared the Bir el Mukheisin area, inflicting large casualties at very little cost to themselves.

The enemy now began to accept his check. On 5th July he started to set up an anti-tank screen of infantry and 88 mm. guns running north-east and south-west through the rising ground of El Mereir, and then prolonged, due west beyond Bir el Harra and El Qarir. On this day the first of the Australian oth Division reached the line, and the enemy heard the strains of "Waltzing Matilda" for the first time in this battle. The 24th Brigade came into line in the central sector and two nights later tasted blood in a highly successful raid. Not to be outdone, a New Zealand column made a dash round the enemy's position, reached Fuka airfield and destroyed 40 machines on the ground. They got back, having suffered only seven casualties.

On 9th July the whole of the Australian Division and the 1st South African Division made a bigger attack. They reached their objectives—Tel el Eisa and El Makh Khad—and held them against counter-attacks. The operation, which was completed by 11th July, secured the whole of Tel el Eisa ridge, together with over 2,000 prisoners, most of whom were Italians, 18 tanks and 15 guns. But an attempt by the armour to exploit this success failed.

A position of virtual equilibrium had now been reached and this lasted until the enemy's big offensive on 30th August. But neither side was very willing to accept the fact and there were some fierce battles for position. Three substantial British attacks were delivered. The first, between 14th and 17th July, gained most of the Ruweisat ridge, but Tel el Eisa changed hands three times and finally (with the exception of a valuable salient north of the railway cutting) remained in the enemy's possession, though on the 16th, in one of his counter-attacks, 25 of his tanks were knocked out for the loss of none.

The second attack was an even more serious affair, designed to break through the defences which the enemy was building up. The attack opened on the night of 21st-22nd July. After 24 hours' fierce fighting by the 5th Indian Division, the 5th and 6th New Zealand Brigades, and British armour (the 23rd and 2nd Brigades), an attempt to reach the eastern edge of the Deir el Shein depression and to clear the Ruweisat ridge definitely failed; and German counter-attacks caught two battalions of the 6th New Zealand Brigade. In the north the Australians again recaptured Tel el Eisa, but were driven off the ridge again on the 23rd. On the southern flank, the 69th Infantry Brigade overran the Taqa plateau, but were forced off most of it in the morning. The general result of these actions was disappointing. Two thousand four hundred men and 60 tanks had been lost, and though the enemy had lost heavily too (25 of his tanks and 600 prisoners, mostly Germans, had been captured), there had been no material advance and the enemy had been found too strong.

On the night of 26th-27th July another attempt was made. The plan was to carry Sanyet el Miteirya and the ridge running north-west from it and clear a passage for the British armour through the minefields east of Deir el Dhib. In the centre a feint attack was to hold the enemy.

Two South African battalions lifted the

mines, and the Durham Light Infantry and East Yorkshires of the 69th Brigade passed through and virtually annihilated the German 361st Infantry Regiment in repeated bayonet charges. Farther north, however, the 24th Australian Brigade ran into bad trouble. They took Sanyet but were cut off and with difficulty got out under cover of the 50th Royal Tank Regiment. This check exposed the flank of the 60th Brigade which had to be recalled under cover of the 1st Armoured Division. Casualties were heavy. thousand Australians were missing and 70 tanks destroyed or disabled.

Both sides now sat down to lick their wounds. But all these abortive attacks had illustrated new tactical truths which we were quicker to grasp than Rommel. All had been designed to renew fighting in a fluid form, but none had been able to get through the defensive skin. What was the lesson? No less than that the character of fighting in the Western Desert must be changed. The gun, the mine and the infantryman had come into their own, and the tank was no longer queen of the battlefields.

This did not suit Rommel's character or qualities at all, and it was fatal to the armies he led. He had entertained and imparted the most extravagant hopes. Mussolini himself had hurried to Africa in order to head a victory parade into Alexandria and Cairo, and there was some difficulty in explaining that he had only come on a visit of inspection to Benghazi and Derna. The brass bands specially imported had to be hushed and hidden. Italian bridging units sent out in readiness to throw pontoons over the Nile had to be turned into ordinary sappers and lay mines. All the hopes of which these things were symptoms had to be revived, not least because Goebbels had puffed Rommel into a kind of military deityruthless, strong, hard, invincible. But in point of fact he had his limitations as a general, and one of them was to repeat his tactics. It was thus much easier to guess what he would try to do.

BLAW



THE STAND AT EL ALAMEIN



8. "NO WITHDRAWALS-NONE WHATEVER-NONE"

All through August both sides were hard at work reorganising, regrouping, extending their minefields, probing for information, and collecting reinforcements. On 5th August the Prime Minister visited the Eighth Army, accompanied by Field-Marshals Wavell and Smuts. It is perhaps permissible to break away from the prosaic recital of events and to incorporate an eye-witness account of Mr. Churchill among the troops.

"The desert stands where the desert stood. Nothing much is changed. The flies are bad about here, and netting is essential if one is to get any peace at all—or any food. Lizards sit tightly on the sunny sides of rocks contemplating heaven alone knows what in such desolation. Scavenger beetles go about their eternal tasks, performing impossible feats of strength and cunning in hiding bits of refuse and rubbish. Dogs of all shapes, sizes and colours amble furtively about the camp, instantly ready to yowl and run with their tails between their legs at any sign of displeasure. There are a lot of Bedouins about, and they stalk majestically around, clasping a few eggs in lean brown hands and seeking to trade them for tea or sugar. A few donkeys crop non-existent grass and appear to like it-one of the real mysteries of the East.

"The road runs along the top of a ridge parallel to the sea and separated from it by low sand-hills that are of purest white. The sea is always incredibly blue. Something must have happened to it since the ancient Greeks called it 'wine-coloured.' There are no clouds in the sky. The sun burns more and more brassily as it climbs, and the desert stretches away south, east and west, to lose itself in dancing heat-waves.

"In this setting Mr. Churchill came to see the men of the Eighth Army. We all thought he had rather the air of a pleasant headmaster who had come along to see how his pupils were getting on; only one wasn't too sure that he hadn't a birch concealed somewhere. Perhaps it was the fly-whisk he carried which fostered this idea.

"The little procession of cars churned up great clouds of dust as they bumped over the road. Troops already at work scarcely bothered to raise their heads. A few did, and saw the P.M. smiling at them and prodding two fingers in the air in the 'V' sign. They stared and scratched their heads and peered questioningly at the following cars. We nodded vigorously in answer to their unspoken question.

"On again until, near to the forward positions held by the Australians, the scene changed. Word of his coming had in some way outpaced the cars. So everywhere troops were running to the road, lorries were stopping and men were tumbling out of them.

"Away to the west, the guns banged away sullenly and grumbled in the heat. Up north, tiny planes glinted in the sun as they dived and twisted, and the rattle of their fire came to us briskly but softly on the breeze. It was a normal sort of morning on the Western Desert front.

"For hours in the evening we sat discussing this visit and discovering hundreds of hidden and contradictory meanings. Churchill—Wavell—Smuts! What does it all mean? There are great days ahead."

There were indeed. The first sign of it was the reorganisation of the command and the Army. One of the most difficult tasks in the world is to act upon the conviction that one leader should give way to another; but that conviction had been reached. There was no lack of apprecia-



FORTY MILES FROM ALEXANDRIA.



tion or indeed of admiration for the way in which General Auchinleck had averted imminent disaster. But it seemed possible that in the more or less haphazard distribution of commands which is always forced upon the enormously expanded edition of Britain's small Army in time of war, the best man had not been found for this place.

It was therefore decided that General Alexander, who had been the last man to leave Dunkirk, and had subsequently brought our small forces practically intact out of Burma, should be the new C.-in-C., Middle East. General "Strafer" Gott, the famous and trusted leader of the XIIIth Corps. had been designated to command the Eighth Army. Unhappily, he was killed when two enemy fighters attacked the transport plane in which he was travelling back to Cairo. The Army was therefore entrusted to General Montgomery, who, while holding an appointment in England, had achieved a great reputation for force of character and for insistence upon physical fitness in every officer and man under his command.

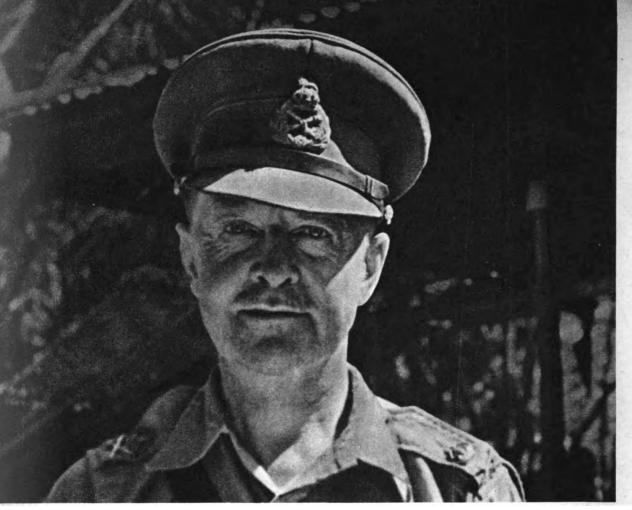
Thus began the fertile association between Generals Alexander and Montgomery which was to win the second wholly irrevocable victory of the war—the first being the liberation of East Africa—to outthink and outmanœuvre the Germans, and to explode the illusion that British leadership is unimaginative, unoriginal, and unenterprising.

It would be more accurate to include in this association Air Chief Marshal Tedder, who as Air Officer Commanding-in-Chief, Middle East, in co-operation with Air Vice-Marshal Coningham, A.O.C. Western Desert, contributed the principle of 100 per cent. army-air co-operation and many new operational tactics; and also Admiral Harwood, who fitted so admirably into the general plan the work of the Navy. There are two other candidates for inclusion in the constellation, namely, General Lindsell and Brigadier Sir Brian Robertson, who organised the Eighth Army's supplies, and thus made possible the follow-through

AUGUST AT ALAMEIN. The Prime Minister comes to see the men of the Eighth Army. He is with General Freyberg, New Zealand Commander.







GENERAL ALEXANDER was appointed Commander-in-Chief of the Middle East Forces, following the Prime Minister's visit.

after every blow which in war is the secret of full success. "Co-operation" is really a misleading word to use about this team. Their work was better than co-operative. As General Montgomery himself said, there was no question of combined operations; there was one single but composite entity. "The astonishing number of new boys around the place quite takes the breath away", wrote an old Eighth Army fan at that time.

There were other things which encouraged confidence. Two fine Divisions arrived from England—the 44th and the 51st. The former

had made a fine defence of Cassel in the Dunkirk campaign, and the latter had the dark days of the Bresle and of St. Valéry to avenge upon their old enemies, the German armoured divisions. In addition, two new Armoured Divisions, the 8th and 10th, were available. Tank losses had been made good. Anti-tank gunners licked their lips over long lines of newly arrived six-pounders. The face of the desert changed daily under the impact of bulldozers and road-making gangs. All these things had their effect on the Army.

"The Eighth Army," wrote a competent observer at this time, "has occasionally felt

that it was battling on alone; and that its trials and tribulations, its successes and failures, were not sufficiently appreciated at home. Now, we feel someone is really taking an interest in us. Of course, this feeling is grossly unfair in many ways, but at the same time it is there—or it was there. It is just that we've felt a bit lonely and that having to come back from Ajedabia twice bit deeply into our souls. The Army had always thought, 'What will they think about this at home?' and the notion that at home they would think we were not what we know we are—a great Army—had been hard to bear."

Rommel had also been receiving reinforcements. Identification raids established the presence of a new German Division (the 164th) and the 125th German Infantry Regiment from Crete, together with considerable formations of German and Italian parachutists being used temporarily as infantry. Using self-propelled barges on a large scale, he also brought up quantities of tanks, and masses of new artillery, including many captured Russian guns which, as one who experienced their fire remarked, have "the devil of a punch." He also had in line a number of 25-pounders which he had captured during his advance. But in spite of this powerful armament, his position and dispositions had weaknesses, some being of his own creating. Rommel had talked too loudly about having in his grasp "the handle of the door." He was bent on attack to the virtual exclusion of all other considerations. Practically everything he had was right forward, and his minefields, though many and thick, were not always well sited. It looked a little as though the poisonous Spirit of Wishful Thinking had changed sides.

He was in grave difficulties with his supplies. All through the last two weeks of August the Navy and the R.A.F. took a heavy toll of the men and material sent him. On the night of 17th-18th August two petrol installations at Tobruk were burned

out. The day before a 7,000-ton ship with a cargo of lorries had been sunk. On 21st August a tanker was wrecked by aircraft from Malta; another tanker was hit on the night of the 26th-27th, and yet a third on the night of the 29th-30th. On the 28th four merchantmen were torpedoed, and ships and aircraft bombarded petrol dumps at El Daba. Four more ships were destroyed on the 31st and all this time there were attacks upon coasting vessels.

Prisoners taken by Eighth Army patrols had said that an attack was planned for 25th August, but it did not come off, and on the succeeding night the New Zealanders made a highly successful raid on the Italians in the Deir el Mereir depression. It became pretty clear that the enemy was short of supplies and particularly of petrol. Probably he had just enough to try a hurricane attack and hoped to capture or to be sent enough to carry on. If this guess is true—and certainly his attack was crippled when he failed to secure more petrol—the sinking of his tankers must rank high among the causes of his defeat. It was not the only cause, and nothing should deprive the High Command of the credit for organising so effective an anti-tank defence and the timely delivery of harassing counter-attacks.

All this space has been devoted to the interval between the big battles at Alamein, because during that time the Eighth Army was virtually reborn. On 28th August General Montgomery held a conference of his officers as a prelude to the attack which the enemy was then clearly about to deliver. "There will be no withdrawals," was the gist of an abrupt but galvanising address, "absolutely none—none whatever—NONE!" He proceeded to give his own estimate of Rommel: "a very able commander, but he has his weaknesses. He has a tendency to repeat his tactics. He has rather a one-track mind."

This forecast proved absolutely accurate when Rommel struck on the night of 30th August.





THE THROW FOR ALEXANDRIA. On the night of 30th August, Rommel sent out the full strength of the Afrika Korps to finish the Eighth Army and open the road to Suez. After three days' battle, the enemy fell back, leaving behind a trail of burning tanks and armoured vehicles.

9. THE LAST BLOW OF THE AFRIKA KORPS

His tactics were a repetition of those successful at Gazala. His striking force comprised practically the whole of his armour (about 580 tanks) and the best of his infantry. He used between 3,000 and 4,000 lorries, and enormous numbers of guns. This striking force was to pierce the Eighth Army's position in the south, strike north behind its lines, destroy or drive off its armour, and then crush the isolated infantry. If he did not reach the coast at the first rush, he would lure the Army into a counter-attack which would be disastrously smashed by his heavy anti-tank artillery.

The High Command's plans were formed on the expectation that his would be precisely what they were. Elements of the 7th Armoured Division and the 4th Light Armoured Brigade were to delay the main encircling movement. They were not to run their heads against his armour, but to withdraw, let his tanks through and then concentrate on destroying the motor transport which would be following up. Entrenched infantry and gunners would meanwhile take the main weight of his armoured attack, and the rest of the British armour, occupying favourable hull down positions, would operate as mobile artillery.

Shortly before midnight on 30th August the West Yorkshires of the 5th Indian Division were attacked by infantry and artillery on the Ruweisat Ridge. The enemy reached the forward positions but were ejected with the help of a battalion of the Essex Regiment. The South Africans in the Deir el Shein area had a similar experience and success. These attacks were clearly only a diversion. At 2 a.m. the 7th Armoured Division reported that strong forces were lifting the minefields round Himeimat. This was the main business. The Afrika Korps were off on the journey

to Cairo, which, according to prisoners, Rommel had promised them.

By midday the main enemy columns had percolated through the outer minefields. They were greatly harassed by the 4th Light Brigade, which claimed to have knocked out 24 tanks. One enemy column halted outside the inner minefields. Another, farther north, advanced to Deir el Muhafid, hence the 90th Light Division started to dig in south of the New Zealanders' position. The better part of the Italian armoured divisions accompanied them, and their purpose was to contain the Eighth Army forces to the north, thus keeping open for the German armour the passage between Deir el Muhafid and the Qattara Depression,

About 5.30 p.m. the enemy halted in an attempt to provoke a counter-attack. When this expectation was disappointed he pushed on north and delivered a dangerously powerful attack on the 22nd Armoured Brigade. It was finally repulsed with the help of the' 23rd Armoured Brigade and the enemy withdrew, having lost 41 out of 100 tanks. He was in some confusion, and in his retirement left a gap between two groups of his armour of which the 7th Armoured Division took advantage to poke at his flanks. There was some desultory fighting, in which the 7th Motorised Brigade, the Rifle Brigade, and the King's Royal Rifle Corps distinguished themselves; this cost the enemy 30 more tanks. His air force attempted to co-operate, but lost 15 machines while the R.A.F. lost only three.

Great satisfaction was felt as the result of this first day's fighting. By repeating his tactics of encirclement, without regard to the fact that the terrain, unlike the battlefield of Gazala, did not lend itself to wide manœuvre, the enemy had got himself



SO NEAR TO SUEZ.

into difficulties. He could not disperse his forces to lessen casualties from bombing, and R.A.F. squadrons were over him all day, arriving with the frequency of Tube trains, dropping their loads and going back for more. The medium artillery also found some grand targets in the forces massed solidly between Himeimat and Bare Ridge. An officer in a forward observation post on the ridge had a bird's-eye view of the whole scene.

"There," he writes, "stretching away to the south, was the black mass of the Afrika Korps. Here, on the left, tucked into folds of the ground, was a mass of our tanks. About 30 of theirs with a couple of selfpropelled guns nosed up to the very edge of the minefields below the ridge. They had no sooner reached it than our 25-pounders, which had been impatiently waiting, opened up with a crash. As they did so, a bunch of our tanks " (they belonged to the 8th Armoured Brigade) "came streaking in from the flank and there was a fierce and bloody battle. Fifteen German tanks are still burning below, and seven of ours are burning or stopped. One of the self-propelling guns went for six, and the other sheered off."

The enemy added to his own embarrassment by getting many of his tanks and lorries bogged in patches of soft sand, and having to use unexpected quantities of petrol to get them out.

The importance of this on the course of the battle was that the enemy had started it short of petrol, the supplies he had expected had been sunk on the way, he had not captured a single gallon, as he had hoped to do, and was therefore faced with immobilisation and disaster unless he retreated quickly.

Those in the Eighth Army who possessed British diaries found noted under the date of 1st September "Partridge Shooting begins." It began on that date in this battle with some excellent shooting at enemy convoys. All day the enemy tanks and lorries were heavily bombed and shelled, and attacks were carried as far as the target of transport between Gamut and Sidi Barrani. Many petrol carriers were thus destroyed. The enemy sat quiet under this fire all that day and the next, either because he could not help it or because he still hoped to provoke a counter-attack. The bulk of the British armour used nothing but its artillery; but the 4th Light Armoured Brigade and the 11th Hussars were out on the lines of communication west of Himeimat, and the 4th Hussars with the City of London Yeomanry were busy in the Gaballa area.

On the morning of 3rd September, it was apparent that British strategy and tactics had succeeded. The enemy had fallen back during the night to Deir el Ragil behind a protective screen of guns. All day the shelling and bombing were redoubled, two ships coming from Crete were sunk by torpedo-carrying Wellingtons, and a tanker was set on fire.

Odd little scraps of the enemy's original plans continued to function. On the night of 3rd-4th September a party of 14 Italians, who had landed from a rubber boat to blow up the railway west of the Maryut lake, were captured. Moreover, he was still clinging on to some of the ground taken when he came round Himeimat. A Brigade of the 44th Division with the 5th New Zealand Brigade therefore put in an attack that night to clear the Deir el Muhafid depression. They had heavy casualties, partly because an ammunition lorry caught

fire going over some rising ground and the attacking troops were silhouetted against the blaze; but the objective was secured, and four enemy counter-attacks next day failed.

Meanwhile, the 10th and 7th Armoured Divisions were slowly driving the enemy back towards the outer minefields. He went back in good order but with considerable losses. Next day he admitted defeat by announcing in his official communiques that he had intended only a reconnaissance in force. Unfortunately for him, his Order of the Day, issued just before the advance, had fallen into our hands. Its salient sentence was, "To-day the Army, reinforced by new Divisions, will launch a new attack in order finally to destroy the enemy." He had meant real business, and he had lost.

Rommel's last bid for Alexandria was now petering out. The best that he could put against the Eighth Army had not been good enough. Fifty-three of his tanks had been permanently destroyed, apart from the very large number damaged and got away for repair. General Freyberg, in the course of a later report on the battle, gives a second main reason, besides lack of petrol, for the enemy's failure. Blitz tactics had caused his infantry and artillery to lose the power of independent offensive action. They had, he said, become "tank followers" and had "lost their old skill in handling their personal weapons."

The Eighth Army had lost about 100 tanks, including 30 Grants, but its repair organisation was now so good and reinforcements so great that a fortnight later 860 tanks were in running order, including 180 Grants and 108 Shermans. There were also more than 500 25-pounders and nearly 400 six-pounder guns among the artillery.

By 7th September the enemy appeared to have completed his withdrawal and his forward positions followed the line of Deir el Angar—Deir el Munassib—Himeimat. There was no attempt to disturb him unduly because the Eighth Army's job was to pile up strength for a big offensive of its own.

10. MONTOSMERY PREPARES TO STRIKE

The first real pin-pricks were experimental raids carried out by sea-borne landing parties assisted by raiding parties operating overland on the night of 13th-14th September. They were not a success. The main attack was on Tobruk. Overland went a column of the Surrey and Sussex Yeomanry, anti-aircraft and coastal defence gunners, and a patrol of the Long Range Desert Group. Shortly after midnight this party attacked and carried a strong-point on the north side of Tobruk harbour.

Meanwhile, the sea-borne party, consisting of a company of the Argylls, a platoon of the Northumberland Fusiliers, with Royal Artillery and Royal Engineers details, embarked on M.T.B.s. The speed and low freeboard of these craft make it difficult for them to keep in touch at night. They lost touch on this occasion, arrived independently, and, owing to the failure of recognition signals, were fired on by British troops. Only two succeeded in landing troops. Some destroyers, in the face of strong opposition, succeeded in landing a party of Royal Marines and attached troops at Mersa Matruh. The destroyers were then caught by searchlights and though they hung on most gallantly, two were lost, together with four M.T.B.s and two motor launches. The Army losses alone were 38 officers and 419 men. An overland party, designed to raid Benghazi, was caught by bombers and had to withdraw towards Jalo. Another party, in spite of heavy air attack, reached Barce airfield and did a lot of damage. Both these parties later joined up and attacked Jalo itself, but after five days' hanging on to one end of the oasis, were forced, by the arrival of strong enemy reinforcements, to retreat to Kufra.

On the main front, September passed quickly, enough after Rommel's repulse;

but though there was no big-scale fighting, both sides were feverishly active. As part of the Eighth Army a new Corps—the Xth was being formed in the greatest secrecy, since it was designed to deliver the coup de grace in the projected offensive. But this Corps was not the only part of the Army which used the lull for intense and continuous training. Tactics are never static, and a selfsatisfied army which remains content with "tried methods" is half-way to being beaten. The mighty Prussian Army, formed and trained by Frederick the Great, was soundly beaten a few years after his death by a rabble at Valmy, largely because it was shackled to a certain kind of tactics which was upset by the unexpected. The Eighth Army made no such mistake. Between operations and even during operations it was ceaselessly applying new lessons to itself.

The enemy was far more content to rest on his laurels. During the lull he concerned himself chiefly with fortifying his positions, and his minefields spread over the desert like oil rings expanding on water. He seemed to have an inkling of what was coming, and Rommel himself went to Berlin for consultations. He was lionised—at least by the Press, to which he gave a confident, not to say boastful, account of the position. "I have not advanced to El Alamein," he said, " with any intention of being flung back sooner or later. You may rely on our holding fast to what we have got." Reports which were not published, however, indicated that he took a different line with the General Staff, that he implored them for reinforcements, and formally refused to resume his attacks unless all his requests were granted. There were yet other reports that he was wholly subservient in the presence of Hitler himself. That is the trouble, of course, with German commanders



THE PLANS ARE PERFECTED. The Eighth Army is entrusted to General Montgomery. Here, wearing his borrowed Anzac hat, he confers with officers of the 9th Australian Division.

in this war. It is as much as their careers are worth to be other than "Yes-men" to the intuitions of the Master Mind. Rommel therefore had to be content with the promise of one new division (apart from the usual replacements). This was the 20th from Crete; but the promise never materialised and rather less than a battalion actually reached him during October.

The main reason for this lag in his reinforcements was the increasing peril of the Eastern Mediterranean crossings. Thanks to the establishment of Allied air superiority, very little could get through to any port east of

Benghazi. In the first three weeks of October three-quarters of the Axis sea transports were lost, and between 10th and 23rd October, 27 ships were sunk or badly damaged. Rommel tried his old game of protecting the Tripoli route by violent air attacks on Malta, but these were not renewed until the 11th, and there was not time for much to get across before the Eighth Army's offensive.

On 30th September the lull on land was broken by a sharp action against Deir el Munassib by battalions of the Queen's Royal Regiment. One battalion took and held the northern tip of the depression, while



THE TANK CREWS PREPARE . . .

another, though they ran into mines and wire, reached a line 1,000 yards south of the depression and held on there. The enemy belonged mostly to the Folgore Italian Division, who were fairly recent arrivals. They were parachutists serving for the time being as infantry. They were tough troops, and gave the Eighth Army a new idea of the fighting qualities of the Italians. On 5th October a company of the Royal Sussex wiped out an enemy post on the Ruweisat ridge, and next night the Greek Brigade, which had been forming and training in Egypt since the gloomy spring of 1941, fought a successful patrol action.

These actions are familiar in title through the communiqués, but only those who have been on patrol can realise what it means. It is an essential if undramatic part of an army's work, and the following account of a patrol by one who took part in it shows what this routine work is like.

"It took about three hours to reach the enemy lines, and then we lay up for a while in what was only too perceptibly a very foul piece of old battle-ground. There were a lot of graves, many of them scooped out in the most slip shod way, and some burned-out tanks and lorries. It was very dark. The moon had long since set; but after a time, by the starlight, we were able to make out the enemy's wire and some dim shapes which might have been anything, though I think they were vehicles.

"We could hear two fairly large working parties chip-chipping away at the hard ground with picks and spades; and away over to the right an Italian was singing in a lovely tenor voice. He wasn't a very hard worker; from time to time somebody would shout to him that a spade was better than a song. I am afraid we were glad he was undisciplined,

because his voice gave us a good pin-point.

"After a whispered conference, the youngster leading the patrol crept off with half the party, while the rest of us positioned ourselves to cover their progress and withdrawal. The wait seemed interminable and it was very cold. The working parties carried on all unconscious of the impending blow. Suddenly it came. There was a hair-raising shriek, confused yells, and then the familiar hell of every kind of weapon being loosed off. The darkness was stabbed with flashes and the earth shook to the explosion of mortar bombs. Machine-guns firing on pack lines sent streams of coloured full-stops gushing through the night. One always forgets that between each of these tracer bullets there are two invisible rounds of non-tracer.

"So far as we were concerned it was all much ado about nothing. Nobody was hit and the patrol ambled quietly home to a cup

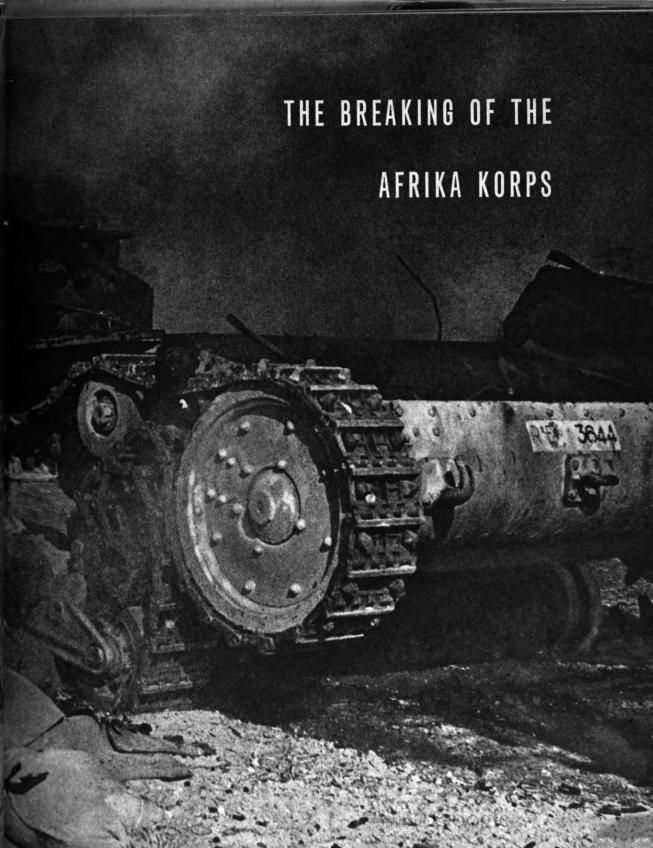
of water, some biscuits and chocolate, and an hour's nap in the bottom of a slit trench."

In these and kindred activities the days and nights passed until 20th October. On that date a special message to the R.A.F. from Air Vice-Marshal Coningham announced that the Allied Air Forces had begun what was to be a decisive battle. "You are very strong," he said, "and can exercise real air power." During the next three days they did, with ever-increasing intensity. On the day of the 23rd the attack rose to a high pitch of concentrated fury, embracing advanced air-bases, lines of communication, gun positions, and concentrations of motor transport. As darkness fell the Navy joined in by shelling dumps and communications at Mersa Matruh; and the Eighth Army stood to for the assault in preparation for which every man had received personal message from the Commander.

... AND THE QUNNERS WAIT.







11. THE BATTLE OF EBYPT: THE INFANTRY BOES IN

All through the preceding fortnight Eighth Army patrols had been lifting mines in the northern sector between Bir. Qusur el Atosh and Bir el Maqtuq, so that the minefields should not impede the advance. By 23rd October they had cleared two good passages in this area. It was here that the main attack was to be delivered. Preparations for this offensive had been made for two long months in the light of past experience. This showed that at least locally and in the initial stages of an attack it was useless to throw armour against prepared positions. The Army's tactics were, therefore, to nibble through these positions in a series of infantry attacks supported by a very powerful barrage from the ground and the air.

A few armoured units were well up with the infantry for local exploitations; but the bulk of the tanks were behind, ready to go through after the infantry and guns had cleared the way. There were, therefore, collected in the north the XXXth Corps, composed of 14 Infantry Brigades and one Armoured Brigade, supported by about 800 South of the XXXth Corps came the XIIIth Corps, of seven Infantry Brigades, two Armoured Brigades and a French flying column. The Xth Corps, comprising two Armoured Divisions, was coming up behind the XXXth Corps. Two New Zealand Brigades and an Armoured Brigade were also in the offing as a separate formation. Xth Corps was intended to be, and was, the big surprise of the battle. It had been concentrated for training 50 miles back, and at the critical moment it moved up by night.

The enemy was undoubtedly deceived about the time, the place, and the strength of the attack. Moreover, the Corps had had a rehearsal of the battle over an area arranged, so far as possible, to be exactly like the

prospective battlefield. It is less confusing to give the dispositions in this way rather than by specifying Divisions, because the Divisional organisation varied very much. Thus, the 23rd Armoured Brigade was split up between the infantry divisions of the XXXth Corps, the Greek Brigade with the 50th Division (one of whose Brigades was reckoned with the 4th Indian Division), and the 1st Fighting French Brigade with the 7th Armoured Division.

Rommel had not returned to his Army when the battle opened. He had left General Stumme in command; but Stumme was killed during an air-raid on his H.Q., and von Thoma took over; but there is little doubt that the enemy's dispositions were Rommel's responsibility. They were faulty, and based on the assumption that the main attack would come in the centre on the Ruweisat sector. He would have welcomed an attack there; and his plan was to delay it only so much as a single Italian division (the Bologna) could, and then counter-attack from both flanks. He had massed nearly all his German infantry, two motorised Italian-Divisions and about half his tanks in the north. The rest of his tanks, some German parachutists and four Italian Divisions were in the south. After General von Thoma had been captured, he blamed Rommel for two tactical mistakes. His armour and anti-tank guns in the north were massed so close to the line that they suffered heavily and needlessly from artillery fire. In the second place, his minefields were badly arranged. Large sections of them were not under observation of the German artillery, and therefore could be lifted with less than the expected casualties and delay.

"Lifting mines" sounds such a simple business. Men of the Eighth Army often



wondered what the readers of communiqués thought when they saw the phrase: "A path was cleared through the enemy's minefields." That phrase covers, in fact, an extremely complicated operation. Look at this mine-clearing party going out. The men in front are a reconnaissance section, rather like the bayonet men in the old grenade fighting in trenches. The two men on their flanks are tommy-gunners. Their job is to make any enemy encountered by the reconnaissance section keep their heads down. The party behind them, carrying what look like sections of gaspipe, are the torpedo party; and their gaspipes are Bangalor torpedoes to blast a path through barbed wire. The dusty tramp just behind them, carrying a revolver, is the section officer, and the men on either side of him are carrying rolls of tape to mark the cleared channel.

The next party, looking like housemaids with Hoovers, are the men working the minedetectors—not the least contribution to the victory was the timely arrival of enough of these instruments, which were turned out by British factories as a rush job. These Hoover men actually locate the mines. The party behind mark the mines with little flags. The next party render them innocuous—"delousing" is the Army name for their job. Behind them comes the section N.C.O., and, last of all, the men to mark the entrances to the gaps with notice-boards and special lamps, visible only to oncoming troops.

The job is difficult as well as elaborate. For example, during the battle one section officer had three trucks blown from beneath him in eight minutes. The parties were nearly always exposed both to close-range and long-range fire, and often had to improvise methods other than those of the drill-book. Here is a veteran Australian mine-lifter demonstrating his methods to a visitor. "I walk along like this, and I give a kick here and a kick there. Now, if you look, you'll see I've got one." And indeed, with his second gentle kick, he had uncovered a French-made mine. He proceeded to "de-

louse" it. Meanwhile he talked. "Yes, I've been doing this since Tobruk—the time when we held it. No, my lot have never had any casualties from mines or booby-traps. You get a sense for them, I suppose. I've pulled up thousands.

"Now the other night when we began this attack, we had a fair job to do. They were as thick as thieves, these mines, and boobytraps in between them. Then there was that barrage going on; but, best of all, there was a bright moon. We had a bit of shelling, of course, but that's not the trouble you think it is. No; it's machine-guns on fixed lines. They're unhealthy."

The Australian and his section had cleared a wide path through the minefield, and the casual way they moved about and the lack of respect they showed for mines and boobytraps alike were a little worrying to the observer. As they worked some enemy 75's began shelling, and some of the bursts were only ten or twenty yards away.

It is not surprising that no men more fully gained or more amply deserved the admiration of their comrades than the sappers and military police whose job it was to clear and mark the mines.

As darkness fell on 23rd October, the Eighth Army stood to for a battle which their General had warned them would be decisive. Up to 9.40 p.m. there was only the normal desultory shelling. A brilliant moon had risen, but its light proved of little use to the troops because the dust and smoke of the barrage reduced visibility to a few yards. This had been foreseen, and Brigade boundaries in the action were marked by Bofors guns firing tracer ammunition along the dividing lines.

At 9.40 precisely the guns opened up. For 15 minutes they concentrated their fire on the enemy's artillery, whose positions had been carefully pin-pointed for weeks, and at least 20 guns fired upon every one of the enemy's. Then the gunners switched to the support of the advancing infantry. The barrage was most intense in the northern sector, where there was one gun to every



23rd OCTOBER, 1942, 2140 HOURS. THE INFANTRY WAIT TO ADVANCE THROUGH THE DUST AND SMOI

23 yards of front, but it was heavy everywhere. There can be no doubt of its effect. As they passed over the ground next day, the troops saw how well the guns had done their work. "Whole gun crews," writes one man, "were lying dead round their guns. Even in the slit trenches and dug-outs many had been killed. We found one signal officer dead with the telephone still at his ear, and a man, who had been about to light a cigarette, dead with a cigarette in one hand and a box of matches in the other." Twenty minutes later the infantry started.

In the extreme south, two battalions of the Foreign Legion and a flying column of Spahis under the command of Colonel Amilakvari staged an attack south of Himeimat. They penetrated two and a half miles beyond the hill and next morning repelled two counterattacks. Having done their job of immobilising considerable enemy forces, and being again attacked by tanks, they then withdrew.

North of Himeimat the 44th and 50th Divisions penetrated the first belt of minefields in four places and the Greys, followed



AS THE GREAT BARRAGE THUNDERS AT ALAMEIN. BY MORNING THEY WERE FOUR MILES FORWARD.

by the 5th Royal Lank Regiment, passed through. They got into some trouble in the second minefield, and it was decided to postpone further attempts at penetration until some annoying anti-tank and machine-gun posts still holding out behind them had been cleaned up. Meanwhile on the Ruweisat ridge the 4th Indian Division took and held a point near the west end of the ridge. A naval operation off Ras el Kenayis made the German 90th Light Division think a landing behind their lines was being attempted, and kept them off the main battlefield for some vital

hours. All these were essentially holding attacks.

The main blow was delivered in the northern sector, where, as already stated, patrols had cleared two gaps in the outer minefields. Three Infantry Divisions (the 51st, 1st South African, and 2nd New Zealand) poured through the southern gap with two Armoured Brigades in close support, and the 10th Armoured Division following on behind. The 1st Armoured Division went through the gap made in the outer minefields behind the 51st Division and the 9th

Australian Division; then, clearing a gap for themselves, they went ahead.

By 10 a.m. these forces had driven a wedge into the enemy's position four miles beyond his outer minefield. It was a narrow wedge, about six miles at its broadest point and narrowing to an apex of little over half a mile, and the enemy seemed at one time inclined to counter-attack with his armour. But he had been taken by surprise—some prisoners were taken still wearing pyjamas—and finally decided to hold his hand for a little longer. However that may be, he left the 164th and 90th German Divisions, the Italian Trento Division and the 15th Armoured Division to deal with the northern attack as best they could in the opening stages. Not until 25th October did he begin to move the 21st Armoured and the Ariete Divisions to the north. The attacks in the south had fulfilled their purpose of containing the enemy's armour during a period when it would have been much more usefully employed elsewhere.

Many very gallant deeds were done during the early stages of this attack, and it is worth while pausing in this narrative to recount a few of them.

The first is from an observer with the Australians.

"Two diggers came up behind me. I could see more of our infantry away to the left and right. A fair number of German shells were falling around us, and I kept low. A Spandau (German machine-gun) opened up directly in front of us. It was sending lines of tracer at us. The bullets were screaming round. One of the diggers said, very quietly, 'Come on, Jim. We had better go in. We'll get that bastard.'

"'God!' I thought. 'Fancy going into

olose-up of A great sattle. Along the 40-mile line from Qattars to the sea, the Battle of Egypt is being fought. The first enemy strongholds have been overrun. From one of them these Australians are bringing in a wounded prisoner.



that!' But they went in quite steadily, as if
they were using the lines of tracer as guiding
tapes. They disappeared in the direction
of the Spandau. I don't know what happened
to them."

The second is a glimpse which another observer had of a South African corporal.

"I never saw such cold courage. The platoon commander was knocked out right away by the heaviest sort of mortar fire the enemy could bring down. The corporal at once took charge and led the platoon on to the final assault. The last fifty yards were over absolutely open ground strewn with booby-traps and mines. Men were going up and being flung into the air like rag dolls. That corporal rushed straight on. I saw him hit twice, but he didn't falter. The platoon took the position."

The third is the story of two men of the Royal Corps of Signals.

"They came slowly, their eyes cast down, over a piece of ground like a stage setting of a lunar landscape with a backcloth of shell bursts. Now and then they would stop, stoop, fiddle with something on the ground, rise and plod on again. When they came abreast, I called over to find out who and what they were. They said, 'We're Linesmen, Sir.' Their eyes were red-rimmed, dust was thick on them, caked on their faces, and leaving their lips unnaturally red and their teeth staring white. We shared a tin of bully. I never ate with better men."

During the day of 24th October a rather tentative counter-attack against the left of the Australians was broken up before reaching their positions. South of the Australians, the Seaforths of the 51st Division did a lot of successful mopping up, and the rest of the 51st reached and occupied all its final objectives. At night, the Xth Corps started to push its armour through the minefields still stretching in front of the infantry. It encountered much bombing and suffered losses from long-range fire by heavy artillery, but soon after dawn on the 25th, one Armoured Brigade, the 8th, got through and established

touch with the 1st Armoured Division. The 7th Motorised Brigade followed and linked this armour with the 51st Division; later, the lorried infantry attached to the 10th Armoured Division took over the Miteirya position, thus freeing the 8th and 9th Armoured Brigades and the 5th New Zealand Brigade for possible exploitation. In the afternoon there was a good deal of small-scale and inconclusive tank scrapping on this northern sector. Kidney Ridge strong-point could not be taken, but neither could the enemy make any impression on the gains that had been made.

Meanwhile, in the south where, as already described, there had been a hold-up after an initial advance, the mopping up of strongpoints in the outer minefields was completed and two passages cleared by hand through the next belt of mines. Two battalions of the Queen's went through and established a bridgehead, but the 22nd Armoured Brigade in an attempt to exploit this advance came under very heavy gunfire from Himeimat and from German tanks. They were ordered to draw off and come north and returned, bringing with them many prisoners.

Up to 6 p.m. on 25th October the Eighth Army had taken over 1,400 prisoners, nearly half of whom were German. The 25th had been, on the whole, rather a sticky day, but the enemy had been hit harder than was known. The reason why his counter-attacks had not been more violent was that he had always attacked with only a fraction of his total armour, and that every time he had concentrated for an attack, the R.A.F. had been over him delivering heavy loads of bombs. Any attacks which did develop had suffered badly from the artillery and from the guns of the tanks. It has been discovered since that Rommel did not like the look of things at all and wanted to retire to positions west of El Daba. There is no doubt that this would have paid him handsomely, but Hitler came to the rescue by ordering him to stand and fight where he was. This order was ultimately fatal. His troops, exposed to ever fiercer artillery fire, became shaken. In tank engagements the Sherman "shone like a beacon," to use the phrase of one who saw it work. Victory was therefore certain, provided the enemy stayed to be beaten; and thanks to Hitler he stayed.

On the night of 25th-26th October, the 26th Australian Brigade attacked northwards from the salient with great dash and by dawn had secured a line running west-north-west from Tel el Eisa for a distance of three miles. They were much helped by a German map which had been captured by one of their patrols. Simultaneously the 51st Division widened the salient to the south by taking two points from Ramcke's German parachutists. Farther south the 60th Infantry Brigade carried part of the Deir el Munassib depression. On the following night the obstinate Kidney Ridge was carried by the 7th Motorised Brigade, but an attempt by the armour to advance farther met heavy gunfire and was stopped.

On the 27th there were some more attempts by the Eighth Army to advance and two strong but ineffective counter-attacks by the enemy at Tel el Eisa and Kidney Ridge. It was at the latter position that the 2nd Battalion of the Rifle Brigade fought the memorable action in which their Commanding Officer, Lieut.-Colonel V. B. Turner, won the Victoria Cross. The following is the official account of what he and his men did:

"Lieut.-Colonel Turner led his men in a night attack over 4,000 yards of difficult country, and captured his objective, together with 40 prisoners and two 88 mm. guns. He then reorganised the position for all-round defence against the counter-attack. This position was so isolated that replenishment of ammunition was impossible and no support could reach the battalion owing to the heavy concentration and accuracy of the enemy's fire.

"From early morning until late in the evening the battalion was subjected to repeated attacks by nearly 100 German tanks, which advanced in successive waves, all of



which were repulsed with heavy losses to the enemy, 35 tanks being burned out and another 20 immobilised.

"Throughout the action Lieut.-Colonel Turner never ceased to move in turn to each part of the front as it was threatened. Wherever the fire was hottest and the fighting fiercest, he was to be found, bringing up ammunition, encouraging his men and directing the fire of his guns. Finding a six-pounder in action alone of its platoon, the others having been knocked out, he himself acted as loader and destroyed five enemy tanks at point-blank range. While manning his gun he was wounded in the head by a machinegun bullet; but he refused all aid until the last remaining tanks had been destroyed, when only one shell for his gun was left.



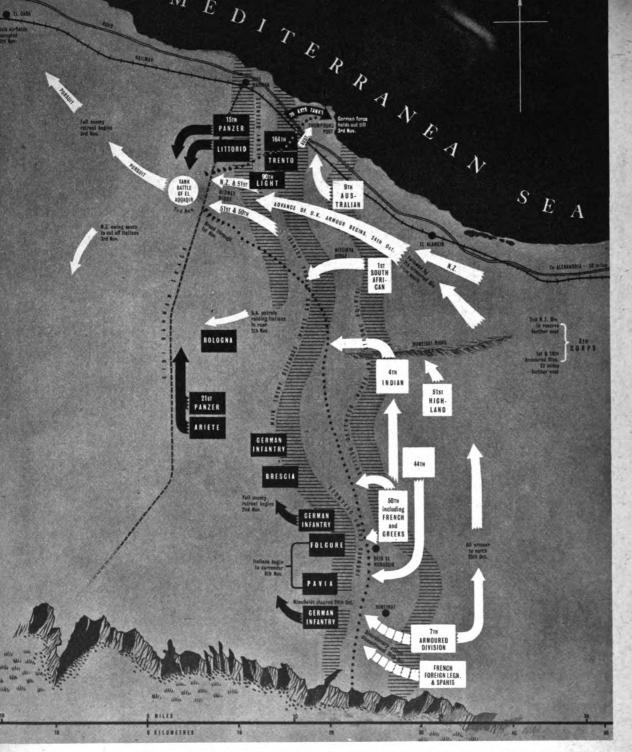
WOUNDED MEN OF THE HIGHLAND DIVISION are tended at an advanced dressing station. In heavy fighting their comrades have taken the first objectives.

"His superb bravery and complete disregard for danger resulted in the infliction of a severe defeat on the enemy's armour in one of the finest actions of the war, and set an example of courageous leadership which was an inspiration not only to the whole battalion, which fought magnificently, but also to the entire Eighth Army in the critical opening days of the offensive."

The enemy was apparently so astonished at the result of this action that he could not believe it and in his communiqué made the completely false claim that he had recovered his entire original defensive line. The lie was given him again next day, when he concentrated all his armour on the south side of the salient, but it was so heavily bombed that no attack developed.

At 10 o'clock that night, the 20th and 26th Australian Brigades attacked again, reaching Bir Menei Abu Afash, but being held up about a mile south of the coastal railway.

It was now becoming clear that a breakthrough and victory would not be secured without a further more general and carefully prepared attack. Though the Eighth Army had taken over 3,000 prisoners, knocked out a large proportion of the enemy's tanks and anti-tank guns, and made some useful advances, on the whole the enemy had been able to seal off penetrations with a screen of artillery; against this it would have been folly to repeat the Gazala mistake and dash the armour. "The strain of this terrific battle is telling on everybody," wrote one observer, "but there can be no let up."



BREAK-THROUGH AT ALAMEIN. The Battle of Egypt was the first decisive battle lost by the Axis in Europe or Africa. The map shows its course. Infantry of the Eighth Army delivered a frontal attack against the north of the line. In nine days' fighting a path was cleared for the Armoured Divisions. They poured through to defeat the massed Panzer Divisions at El Aqqaqir.

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12. EL AQQAQIR: TRIUMPH OF THE ARMOUR

From the 27th onwards, the British Command was organising a new and heavy blow which was to prove successful. It had become necessary to force a real breach at all costs. For this purpose a composite force was formed under General Freyberg, the G.O.C. the New Zealand Division. It consisted of the 5th and 6th New Zealand Brigades, the 151st Infantry Brigade (the 6th, 8th and 9th Durham Light Infantry), an Infantry Brigade from the 51st Division, the New Zealand Divisional Cavalry, an Armoured Brigade with the 31st New Zealand Anti-tank Battery, the 23rd Armoured Brigade, supported by the 121st Field Regiment, with self-propelled field guns, the 168th L.A.A. Battery, and the 29th Field Park Squadron, three Regiments of New Zealand Field Artillery with a New Zealand Anti-tank and L.A.A. Regiment, four companies of New Zealand Engineers and one of Sappers of the 51st Division. Finally, attached to the British infantry Brigades were two British anti-tank batteries and three machine-gun companies.

This formidable force was to be supported by the greatest artillery concentration yet organised in Africa firing a creeping barrage and instructed in every detail of its task. The attack was to be pushed home at all costs; and if pockets of tough resistance were encountered, the infantry were to by-pass them in order to keep up with the barrage. If by chance the barrage went too fast, the tanks were to keep up with it and the infantry follow as fast as they could. So carefully prepared an attack took time to organise. Originally timed for the night of 31st October, it was postponed until the early morning of and November. While it was being mounted the enemy was to be allowed no respite. The Australians were to keep him busy and themselves attack on the right flank of the big offensive.

The Australians' job was nobly done. On the night of the 30th, having repulsed two enemy attacks during the day, their 26th Brigade, supported by United Kingdom tanks and by the New Zealand divisional artillery in addition to their own, carried their line forward north of the railway. The 24th Brigade also advanced and the tip of their salient nearly reached the sea. This resulted next day in the cutting off of an enemy group in Thompson's Post, so called after an Australian officer who had made a habit of patrolling the locality. They were not attacked immediately, and a few German tanks infiltrated along the shore to join them. In view of what was about to happen no objection was taken to this manœuvre.

On 1st November there was some evidence that the enemy thought the attack in the north had shot its bolt. He pulled back into the southern sector some German reconnaissance groups which had been moved up to reinforce his troops in the north; and was thus less able to resist the new offensive. The Thompson's Post garrison made three attempts to break out, which were foiled, though some individuals got away. As had been expected, the post fell into the hands of the Australians without much further trouble after the main attack had got under way.

Launched just after one o'clock on and November, this attack was highly successful. By half-past five the Brigade on the left reported that they were reorganising on their final objective after an advance of three miles; their casualties were very light, and there was a clear lane right through the enemy's lines. Half an hour later the 151st Brigade reported that they also were through, and the armour advanced to exploit the victory.

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THESE TANKS ARE IN ACTION against an enemy armoured formation on Miteirya Ridge during the opening phase of the Alamein offensive. Beyond the Shermans on the false horizon the ground continues to rise. The tank gunners are firing over this rise at the enemy tanks sheltering behind the next slope in the desert. The tank commanders, silhouetted against the sky, stand on the turrets to direct the guns.

The brunt of the enemy's first reaction fell on an Armoured Brigade. The 3rd Hussars had heavy casualties from shell-fire but reached the Rahman track. So did the Royal Wiltshire Yeomanry. The Warwickshire Yeomanry also got well forward but were too far south to be in touch with the other units of the Brigade. All three were exposed at dawn to fire from dug-in tanks and anti-tank guns at short range. Squadron leaders' tanks were knocked out, wireless control was lost, and the tanks

fought individual actions all day. The 3rd Hussars had twelve tanks left, the Warwicks seven, and the Wilts none at all; but the enemy had lost 71 more tanks and his gun line was destroyed. It was a memorable action.

The enemy was now absolutely forced to counter-attack; but he had been over-nervous about the coastal sector, and had to spend precious time in moving his two Armoured Divisions. This gave the 2nd and 8th Armoured Brigades time to move forward, and when the enemy did attack



The tanks on the left of the picture are moving through their own dust to take up a position to the right of those on the skyline, where another cloud of dust created by bursts from the guns drifts away over the desert. Almost all the vehicles in this picture are Sherman tanks. There are a few armoured cars with them. Most tank battles are impossible to photograph, and this picture is probably unique of its kind.

early in the afternoon of 3rd November, they were ready for him. His onset carried him clear across the bulge, but he could not hold on, and had to go back again. This double running of the gauntlet cost him very dear, the 2nd Armoured Brigade alone destroying 25 of his tanks.

This heavy defeat was rubbed in in great style by the R.A.F. Rommel had asked the Luftwaffe for a special effort, and a large number of Stukas and fighters came over. American and R.A.F. fighters were waiting for them, and shot down seven Stukas without loss. The rest dropped their bombs on their own people—a particularly demoralising experience. Judging by the prisoners taken on this day demoralisation was certainly growing. Many had not been able to leave their dug-outs for almost 24 hours because of our bombing and shelling and some had had no water for 36 hours.

An attack in the evening by the 50th Division's infantry, supported by the 50th Royal Tank Regiment, widened the bulge



THE RAIDERS. South Africans listen to their orders for the dangerous raid through the enemy lines to El Daba on 3rd November.

to the south with very little trouble. At dusk the 7th Motorised Brigade and the King's Royal Rifle Corps got across the Sidi Rahman track, and during the night the 5th Indian Infantry Brigade, attacking southwest between the 51st and 1st South African Divisions, made a final break-through more than four miles deep. Through this gap our armour poured, to demolish the rest of the enemy's armour at El Aqqaqir.

On this day the British forces in the south, which had kept most of the Italian infantry

and many Germans pinned down by diversionary operations, found resistance opposite to them slackening. The French occupied Deir el Munassib, patrols from the 44th and 50th Divisions advanced towards the Sidi Rahman track and reported the forward areas all clear. The 4th-6th South African Armoured Cars went through the gap in the inner minefields and made towards El Daba to effect a junction with the Royals, who were engaged on the most spectacular raid of the campaign. The following account

of it, by an officer who took part, illustrates so brilliantly some of the extraordinary features of a desert battle that, at the risk of breaking the thread of this narrative, it must be interpolated.

"Let me say," the officer began, "that we attribute the luck which attended our initial break-through to the splendid work of the infantry and the artillery, which paved the way.

"We left our location and passed through the minefields in single file. No shot was fired at us. The only impediment to our progress occurred when the first car ran into an 88 mm. gun pit filled with dead Germans. One or two more cars, including three petrol replenishment lorries, got stuck in slit trenches, but most of them pulled out when dawn broke and fought their way up to us.

"The enemy was too astounded to do anything as we came through, or else the Italian section thought we were Germans and the German section thought we were Italians. They waved Swastika flags at us with vigour and we replied with 'Achtung!' and anything else we could think of which, with an answering wave, would get us through their lines.

"As it grew lighter they stared and blinked at us. Although a warning artillery barrage had been going on all night, they couldn't believe their eyes. They would goggle at us from short range, see our berets, bolt away a few yards, pause as if they didn't think it was true, and come back to take another look.

"We passed within ten yards of the muzzles of an entire battery of field artillery. Right down the column we went, with Germans standing by their guns and, fortunately, failing to let them off.

"As dawn broke we passed a man in bed. From the mass of vehicles and equipment surrounding him he was obviously an Italian quartermaster. We woke him up by tossing a Verey light into his blankets. He broke the record for the sitting high jump.

"Into one of his lorries we heaved a hand grenade. The results on the lorry were most satisfactory but they scared the second-in-command, who, following in his armoured car, had failed to see us toss the grenade.

"Picking our way through trenches and gun positions, we came upon what was evidently a 'permanent' headquarters. Lorries were dug in, men were asleep everywhere. They were surprised to wake up and see their lorries go up in smoke one by one.

"In the first quarter of an hour the two squadrons destroyed forty lorries simply by putting a bullet through the petrol tanks and setting a match to the leak. The crews of lorries which had got bogged in the break-through transferred themselves to German vehicles holding petrol. Spare men climbed aboard Italian vehicles mounted with Breda guns and on we pushed.

"Germans panicked from their lorries into slit trenches. We had no time to take prisoners. We just took their weapons, and told them to commence walking east. Few refused. The majority were most anxious to oblige us in every way, and readily assisted in draining vehicles we thought fit to immobilise.

"The Italians asked for far greater consideration. They wanted to come with us, clinging to the sides of our armoured cars as they fought each other to come aboard. To stop these poignant scenes a troop leader asked for one of their officers. Half a dozen men stepped forward.

"We explained we couldn't take them all and, skimming off the cream, pushed on with a colonel and two majors clinging for dear life round the muzzles of our twopounders.

"The columns of smoke climbing up from the lorries we burned attracted the attention of tanks and aircraft. We managed to dodge the tanks but the aircraft pestered us throughout the next four days.

"One German pilot adopted a novel

form of bombing. He had probably grown tired of aiming at the small target offered by an armoured car and, attaching a bomb to a piece of rope suspended from his Me.roo, flew over us, hoping to bump the bomb into our turrets. After twenty-four unsuccessful attempts the bomb hit the ground and exploded, causing irreparable damage to his piece of rope.

"The armour of our cars was excellent and the only casualties inflicted from the air were on the German lorries we shanghaied to come along with us. We had one personal casualty—one of the Italian majors swinging round a turret was shot off by one of his

own planes.

"Then the two squadrons parted, one continuing due west, the other going southwest. In the south we cut the Axis telephone lines connecting the left and right flanks of their Alamein line, and added a little more to the general confusion.

"For the remainder of the first day we sat astride their lines of supply, holding up and destroying lorries as they arrived to supply front line troops. This highway robbery continued for another three days without variation, except that instead of burning vehicles and attracting the attention of aircraft we merely rendered them useless.

"Ever since we raided the headquarters we had had reprisals sent out after us. Slow flying reconnaissance Storches came after us. We shot one down. We also came across some aircraft, a marvellous target for our bombers, and sent back the information that they were waiting on the airfield to be destroyed. In an astonishingly short space of time our bombers were over—and so were their aircraft.

"There was an amusing incident when we came across a South African pilot who had been ground strafing. He was shot down practically under the wheels of one of our armoured cars. Expecting to be manhandled so far behind the enemy lines, he couldn't believe his eyes when he realised we were British.

"And so we stayed fifteen miles behind Rommel's lines. The only real battle we had was on November 5th, when our breakthrough took place. We heard later that when told the British tanks had broken through, Rommel's reply had been, 'Oh, yes. I know about that'—in reference to our armoured cars. At the time our tanks really had broken through.

"On the 5th, having waylaid a number of vehicles containing retreating German troops, we met up with several 50 mm. anti-tank guns. Things looked black for us when we met the Fighting French coming

west.

"Fortunately for us mutual recognition came quickly and together we compelled the enemy to leave behind anti-tank guns and some field guns which he had on tow.

"With this our job was over. There was no need to return. The Eighth Army had come out to meet us."

The results of this extraordinary raid were:

For: Two hundred vehicles destroyed. At least thirty guns captured or destroyed, counting nothing of smaller bore than 30 mm. Prisoners nil—eastward-walking Germans and Italians, with astonished expressions still on their faces when picked up by other units, were far too many to be counted.

Against: Seven armoured cars and three lorries. Three men killed, twelve wounded.

It is time to return to the narrative of the battle. The Royals were not the only unit to have this kind of gay adventure. On similar but shorter raids there moved out on this day the South African Armoured Cars, as already mentioned, and the 11th Hussars. Meanwhile, just south of the main battle the 8th Armoured Brigade, in spite of meeting some shelling, reached the Sidi Rahman track by 11 a.m. on 2nd November. In the main battle area itself, the New Zealand Divisional Cavalry found that the enemy were moving back from the north of the salient. As they passed over no-man's-land they found a thick litter of destroyed tanks, jettisoned equipment



and German dead. The tank battle had gone definitely in the Eighth Army's favour. Though losses had been heavy in the armoured units, they constituted only a small proportion of the armour and there was plenty left. Rommel had flung most of his armour into the battle and had lost at least sixty per cent. of it. Moreover, his losses were permanent because without control of the battle area, his recovery service could not operate. By the afternoon of the 3rd, General Montgomery was able to sum up the position in a message issued to the Eighth Army next morning.

"The present battle," he said, "has now lasted twelve days, during which all troops

have fought so magnificently that the enemy is being worn down.

"He has just reached breaking point, and he is trying to get his army away. The R.A.F. is taking heavy toll of his columns moving west on the main coast road. . . .

"I call on all troops to keep up the pressure and not relax for one moment. We have the chance of putting the whole Panzer Army in the bag, and we will do so.

"I congratulate all troops on what has been achieved. Complete victory is almost in sight.

"On your behalf, I have sent a separate message to the R.A.F. thanking them for their quite magnificent support."

STRIKING FIFTEEN MILES DEEP through the crumbling enemy defences, armoured cars cut his rear communications, destroyed his supplies, and smashed his transport.



13. THE FLIGHT OUT OF EBYPT

The night of the 3rd-4th November is therefore the dividing line between the battle and the pursuit. By this time the Xth Corps alone had knocked out 253 tanks and 222 guns. On the 4th the only question was how much the enemy could get away. The answer in the south was nothing. The day before the Italian Divisions there had received orders to retreat. They waited all night for transport, but none arrived; and next morning they received the order to resist to the last. A few pockets tried to obey, but on the whole the enemy was far too short of supplies and water, and all day the 44th Division, with Greek and French Brigades, were mopping up Italians by the thousand. Rommel's denial of transport to these poor men for the benefit of his Germans profited him very little.

During the night of the 3rd-4th, the Australians wiped out Thompson's Post, and at dawn the effort to break and outflank Rommel's screen of guns, tanks, and elements of his ooth Light Division began. The 1st Armoured Division moved in behind the Sidi Rahman track. The Royals and the South African Armoured Cars were south of Gazala. The 10th Armoured Division, supported by the 7th farther south, was advancing on Fuka. As the enemy retreated along the coast road, they were outflanked by tanks and artillery waiting in a hollow south of the road and railway. The men of the 8th Armoured Brigade held their fire until the enemy came within point-blank range, and then opened up with devastating effect. Fifty-four German tanks were destroyed, together with enormous numbers of lorries, and 1,000 prisoners were taken. The Brigade suffered no losses at all. It was a kind of land Matapan.

An immediate consequence of this battle

was the capture of General Ritta von Thoma, commander of the Afrika Korps. The General had undertaken a personal reconnaissance in a Mark III tank towards El Aqqaqir in order to convince an incredulous Rommel that a British force was outflanking him. Arriving at the tail end of the battle, he met a scout car commanded by Captain Grant Singer of the 10th Hussars. The German tank put a shot right through the back of the driver's seat, and, his attention having thus been called to its presence, Captain Grant Singer directed the fire of a supporting British tank appropriately enough it was a General Grant -against it. The German tank was disabled, and the crew baled out. The scoutcar at once advanced towards it and was met by a tall, dusty figure emerging from a slit trench. In Singer's own words, "I thought I might as well collar him. He shouted out that he was a General, and then I noticed rather a lot of gold about him, so I had him come aboard." Unhappily, this gallant officer, who had been General Norrie's A.D.C., was killed while on a further reconnaissance.

Von Thoma had commanded the German tank forces in Spain during the Civil War in the days of non-intervention. He had fought at Louvain in May 1940, and, as General Montgomery said after interviewing him, had captured at Dunkirk some intelligence papers giving most accurate details about himself. He told General Montgomery that the Germans had a similar personal sketch of the character of the Eighth Army's Commander, in which the conclusion was reached that some new tactics could be expected from so "hard" a soldier. General Montgomery asked, "Well, did you get them?" "Yes," von Thoma replied, "and they were too much for us."



THE ENEMY BREAKS. Burning tanks, the foremost with its track laced around it, mark the site of a rearguard action fought as the Afrika Korps made for the frontier. As Eighth Army transport streams west along the road towards Halfaya Pass, long lines of prisoners march by to the east.



As the day wore on, the pursuit became faster. Enemy columns were heavily bombed all through the night, and by early on the morning of the 5th, the 1st Armoured Division had reached the railway west of El Daba. The 9th Australian Division, in hot pursuit along the coast road, reached Bir Qatiabi, and the 51st Division El Daba landing grounds. Here the R.A.F. gave the first instance of the phenomenal rapidity with which they advanced their bases and which made it so difficult for the enemy to rally. These landing grounds were in operation within a few hours.

Meanwhile, General Freyberg's force, having reorganised itself for mobile operations and received the addition of the 4th Light Armoured Brigade, started to move forward on 4th November. Its job was interception in a series of left-handed scoops. The first objective was the escarpment south of Fuka, and on the way it surprised and destroyed eight German tanks, besides taking prisoner the G.O.C. Trento Division. The South African Armoured Cars and the Royals were already raiding farther west as far as the escarpment south of Mersa Matruh, and the 1st and 7th Armoured Divisions were thundering along due west across the desert south of the New Zealanders.

There were both grim and gay touches during this first stage of the pursuit. Here the tanks had charged anti-tank guns flat out. There—notably on the slopes of El Aqqaqir -were cemeteries of Axis tanks. Everywhere the litter was indescribable. At one point huge bundles of maps of the Nile Delta had spilled out of an overturned German lorry. Who was the optimist who had thought of carting them away? Large and small groups of downcast prisoners trudged eastwards. But the main impression made by the enemy's positions was that he had had some reason to think them impregnable. Apart from the mines, there were 88 mm. anti-tank guns in great numbers dug in, with their muzzles no more than clearing the ground, and masses of strongly fortified machine-gun posts,

surrounded by wire, booby-traps, and more mines. These were only the static defences. In addition, the enemy had his four armoured divisions, the 90th Light Division, and a great assortment of oddments which could be rapidly moved to any part of the front.

By 4th November, it was clear that Rommel had no other thought than to get away the remains of his armour, his two German Infantry Divisions, and part of the 101st and roand Italian Motorised Divisions. The whole of the Italian infantry in the south was left without transport or water, and was being mopped up by the 44th and 50th Divisions, while the 10th Armoured Division lay across the path of any possible retreat. In the north, the enemy tried to make a stand on the Fuka escarpment. It was quite a serious business, and the 7th and 1st Armoured Divisions turned north to help in dealing with it. They broke the enemy rearguard early on the 6th, then resumed their flanking movement, and by the evening had reached the escarpment south of Matruh, with the 11th Hussars and the South African Armoured Cars still farther west. The 3rd Battalion of the Royal Tank Regiment were the first troops to enter Matruh itself.

At this moment, when, if the fine weather had continued, the enemy's army might well have been totally destroyed, heavy rain started to fall. It was an outrageous piece of luck. Men, straining to get themselves and their vehicles out of a quagmire, looked up at the pelting skies and remembered how often they had prayed for rain to drive off the flies, screen the sun, and moderate the throbbing heat. It was an unseasonable answer to their prayers. By 7th November, the New Zealanders had to report that they were bogged, and the flanking movements of the armour were similarly stopped. Movement was practically restricted to the coast road, and even the R.A.F. could not see to bomb.

Along the road the traffic was not only one way. Some was going east. It was composed of Germans and Italians driving their own transport into captivity. Later, the same sight in Tunisia aroused great comment as a proof of the complete breakdown in enemy morale; but as the reader now knows, it had occurred seven months before at Alamein. The fact that the Germans collapse readily enough when they are in a tight place is no new discovery. It had been obscured by the overwhelming superiority in numbers and equipment possessed by the German Army and Air Force in its Western European and Balkan campaigns. Alamein revealed it; and revealed also that the superiority of German leadership is quite as great a myth as the superiority of German fighting qualities.

By the time the weather cleared on 8th November, the enemy had made good use of his respite. An officer, who had managed to struggle forward in a car as far as the old Matruh perimeter defences the evening before, found another small rearguard there, but when the 4th Light Armoured Brigade got up about 4 p.m. next day they found Matruh evacuated and the Navy floating petrol barrels ashore in a nearby cove. A few British were found wounded in the hospital and some numbers of a Cape Pioneer Battalion in the prisoners' cage. The enemy had treated the wounded well: but the coloured labourers had been forced to work like slaves at the docks and had been left without shelter from air or sea attack.

Pressing on, the 4th Light Armoured Brigade broke another rearguard at Sidi Barrani, and by the 9th, New Zealanders were approaching Halfaya, the 11th Hussars Capuzzo, and the 22nd Armoured Maddalena—all as part of another attempt at a left-hand scoop. The R.A.F. had a wonderful target in massed transport between Sollum and Halfaya, where an ammunition lorry had blown up and blocked the road with a huge crater. By the evening of 10th November the 4th Light Armoured Brigade and General Freyberg's men were in position to attack the pass itself. After dark 110 men of the

21st New Zealand Battalion walked up the pass without artillery or mortar support and caught the enemy completely by surprise. At the cost of two casualties they took 612 prisoners; some were Germans, but they were mostly Italians of the Pistoia Division, which had moved out of Tobruk and had been left stranded when Rommel repeated his practice of commandeering his Allies' transport. In a brilliant attack at dawn, the 4th Light Armoured Brigade completely cleared the pass, taking 800 more prisoners and 40 guns.

Though there were still parties of the enemy wandering about in the desert to the south, 11th November may be said to be the date of the final clearance of the Axis out of Egypt. It may well be that the anniversary of complete victory in the first world war will prove to have been the date of the beginning of complete victory in the second. The Eighth Army themselves were, however, not over-conscious that they were making history on this particular day. In the diary of one of its officers the main entry is: "11th November. A rotten night. Cold and bitten to death by mosquitoes." He was, nevertheless, moved by the spectacle of our armour rushing on in pursuit.

"Each tank tore for itself a bow wave and a wake of streaming dust that the sun caught and tipped with an airy brush of crimson. They spread out towards the sea and in towards the desert—a racing, roaring army of steel straining their petrol guts in rocking, thunderous motion."

Not a bad code to the story of the Battle of Egypt.

As the Army Commander said in a special message next day, there were no German or Italian soldiers left on Egyptian territory, except prisoners, and the Eighth Army had advanced 300 miles in three weeks, destroying in the process "as effective fighting formations" four German and eight Italian divisions.





NEAN SEA



14. "THIS TIME WE SHALL NOT COME BACK"

"This time," said General Montgomery, "having reached Benghazi and beyond, we shall not come back." The Eighth Army now set itself to make good his words. Already on the 11th its advanced troops were far into Cyrenaica. The 7th Armoured Division with the New Zealanders cleared the area between Sollum and Bardia, where the New Zealanders paused to refit. The ubiquitous 11th Hussars and the South African Cars shot up Sidi Rezegh landing ground while the enemy was trying to evacuate it. The R.A.F. and an American Squadron devastated Gambut airfield, shot down 11 dive-bombers, and made a mess of the enemy columns on the Bardia-Tobruk road. Here is what the Army found when they followed up: "On the sides of the road were huge, deep-riven wheel tracks where panic-stricken drivers had charged off to get out of the way of the deadly storm. They had run into one another. They had toppled over. Cannon shells and bullets had ripped through them. Bombs had torn them to shreds."

The wheel had gone full circle since the roads of France and Greece had witnessed similar scenes. Not only the enemy "soft" transport was affected. Near Buq Buq, 80 tanks of the Italian Littorio Division were found deserted and mostly intact.

Rommel was now going back as fast as he could. His optimism had caused him to bring a lot of stuff up to forward bases, and he was now using all sorts of small craft to evacuate it from Tobruk, Derna and Benghazi. Many of them were sunk; but he did get a lot away, and when the South African Cars entered Tobruk at 9.30 on the morning of 13th November they found only a few Germans to take prisoner.

By that evening none of the enemy was left east of Gazala. The 12th Lancers,

pushing on south of Bir Hacheim, discouraged all loitering in his old positions at Gazala, and by the morning of the 15th the Lancers reached Martuba landing grounds from the west simultaneously with the 4th Armoured Brigade from the east. These landing grounds were of special use to provide air cover for convoys to Malta. The 12th Lancers were ordered to make for Martuba as part of a further scoop. But though the enemy was going faster, he was getting stronger. He had picked up about 50 reserve tanks and received about 50 more ferried across in haste from Italy. The Spezia Division and the Centauro Armoured Division had disembarked at Tripoli and were moving up to the Libyan frontier. If, therefore, he could evade or fight off our scoops he could hope to make a stand in his old lairs at Ajedabia and El Agheila. Helped by more torrential rain on the 15th, and by the mines which he sowed thickly behind him, he did manage to avoid further serious interception. By the 19th his main column had got beyond the dangerous Benghazi bulge where Wavell's men had intercepted the Italians at Beda Fomm, and he withdrew his protective screen to Aiedabia.

The 11th Hussars, who were to make such a habit of being first into former enemy strongholds, occupied Benghazi on the 20th and released a number of British prisoners. But for the next week it was no longer a question of interception but of how fast the Eighth Army could close up. Once again this time miracles were accomplished. By 1st December the railway was open as far as Tobruk. By 19th November two ships got into Bardia. Shipping was using both Tobruk and Derna on the 27th, and by the 24th a ship got into Benghazi, where the water supply was being rapidly



BENGHAZI ANEAD. The Army and the Air Force advanced hand in hand. Here a Honey tank, outdistancing its own supply vehicles, draws petrol from an R.A.F. bowser.

restored. The supply of other than material things was not neglected. It may interest the millions who have seen the film Desert Victory to know that its making was first discussed over a smoky wood fire at Giovanni Berta on the night of 16th November between a Public Relations Officer and Major David MacDonald, head of the Army Film Unit.

Thanks to the work of the supply services, fairly strong forces were up in positions to contain the enemy by 27th November, when he had completed his retreat to the El Agheila lines. The Royals were patrolling in front

of Bir es Suera; the 22nd Armoured Brigade was east of Mersa Brega; the Greys at Ajedabia; the 7th Armoured Division at Antelat; the 4th Light Armoured Brigade, an Infantry Brigade, and the 11th Hussars south of Magrun. The XXXth Corps H.Q., with the South African Cars and part of the 51st Division, were at Benghazi; the rest of the 51st Division, with the 8th Armoured Brigade, were coming up; and the Xth Corps H.Q. were at Tmimi.

It was pretty clear that Rommel could not hope to stage another successful comeback; on the other hand, the El Agheila



ON THE TRIPOLI ROAD. The gun is firing at an enemy strong-point delaying the advance. In the foreground a wounded gunner is tended by one of his comrades.

position was very strong. From Garet el Hamud on the coast to Ma'aten Giofer, the line ran behind impenetrable marshes with an anti-tank ditch cutting across the coastal road. From Ma'aten Giofer to Sidi Tabet was a continuous line of strong-points, and thence to Marada large minefields and wire. Bir es Suera was covered by mined salt flats up to Mersa Brega, where there was a dug-in position covered by minefields.

A strong position has always an irresistible attraction for a weak commander—the classic instance is Bazaine's obsession about Metz in the 1870 campaign—and if Rommel ever

thought about abandoning El Agheila, Hitler could be counted upon to come to our assistance. This he did. On the last day of November, Rommel received the order to hold El Agheila to the last man. The order was probably a consequence of Hitler's other welcome decision to pour troops into Tunisia. He did not want his bridgehead there to become too constricted. Three weeks later the decision to stand at El Agheila was cancelled. The reason was that Axis shipping losses made concentration of all the forces in Africa essential. During the first fortnight of December submarines and air-

craft destroyed one-third of all shipping sent to Bizertà and four-fifths of that sent The Libvan armies must, to Tripoli. therefore, be brought where they could be supplied by the less ruinous route. Ordre, contreordre, desordre, says the French proverb, and so it proved. If Rommel had continued his retreat on 27th November, he could have got his whole force away. Not even General Lindsell by that date could have got his supplies forward; not even the R.A.F. could have got advanced landing grounds into use; and, therefore, not even the Eighth Army could have conducted a serious pursuit. But by 13th December, when the enemy started to retreat again, armour, army and air forces were all up and on their toes.

Already on the night of 11th December patrols of the 51st Division had found no opposition during deep penetration of the enemy's lines; and though a reconnaissance in force next day towards Bir es Suera was counter-attacked, the enemy evacuated the place and also Mersa Brega during the 13th. The Highlanders followed up along the coast road, organised a pursuit force to push through farther south, and occupied Bir es Suera, while the 8th Armoured Brigade with the 11th Hussars moved round the enemy's flank and advanced north towards El Agheila.

Next day the New Zealanders resumed their old job of trying to intercept enemy By the following evening, 15th December, after a wide detour to the south and then due north, the 5th and 6th Brigades reached the Wadi Matratin and planted themselves across the line of retreat. The New Zealanders had thus made a remarkable left-hook over country previously considered impassable, but which they crossed by using bulldozers to bridge a succession of wadis. They had cut off the enemy's rearguard, which included the remains of his 15th Armoured Division and a mass of lorries. The armour with infantry of the 44th and 51st Divisions were pressing as hard on the enemy's heels as his minefields allowed, and it looked for some hours as though his rearguard would be caught. There was, however, too little time for the New Zealanders to prepare a really effective block. The enemy simply charged through their screen, and most got away, though 500 prisoners, 20 tanks, and 30 guns were left behind.

On the 17th there was another sharp action at Nofilia, where the 5th New Zealand Brigade and the 4th Light Armoured Brigade took more prisoners. The enemy army was like a tyre with a slow puncture. At every stage, a little more air leaked out. Sometimes he stopped and pumped it up a bit. Thus it never became quite flat and never burst, but the journey was distinctly uncomfortable.

After Nofilia the first real check was at Buerat, which Rommel reached on the 26th and where he stayed until 14th January for no very good reason. Since leaving Agheila he had received no reinforcements, the Buerat position could be outflanked to the south, and his goal was certainly Tunisia. The halt did him no good, though it did not cost him much. The reason was that the Eighth Army had once again to organise its supply lines over several hundred more miles of difficult and practically waterless country, and that enemy mines were both numerous and troublesome. For example, over 2,000 had to be lifted from the Marble Arch airfield alone. The enemy was not left quiet in spite of these difficulties. During the second half of December the Long Range Desert Group and the Surrey and Sussex Yeomanry were raiding his communications as far west as Tripoli. The French from the Chad territory were also beginning to take a hand in the campaign. Under General Leclerc, they formed a base in the Fezzam at Gatrun, and had advanced north to Sebka by 8th January, taking over 500 prisoners, 18 tanks, and a number of guns.

It may be convenient to conclude here this summary of a remarkable exploit carried out by a force operating 1,500 miles from its home territory. General Leclerc's men contacted the British at Garian on 24th January. About the same time they joined up with General Giraud's force of camelry, and together took Gadames on 28th January. It is unnecessary to stress this first junction since June 1940 between Frenchmen who had escaped and Frenchmen who had been liberated from the Axis yoke.

To return to the Buerat position, Rommel had never intended to persist in his purposeless stand, and by 7th January he began to withdraw his Italian infantry north-westwards. All the remains of his German units and of the Italian armour remained in position. By the 15th the Eighth Army had closed up enough to resume its general advance, before which the enemy retired slowly under cover of strong rearguards. He was, however, too weak and too wise to attempt to hold even the strongest natural positions, such as the deep gullies of the Wadi Zemzem and the Wadi Safejin, for any length of time. Essentially he was in full cry for Tunisia, and merely attempting to delay our advance without loss to himself. Misurata was occupied by infantry of the 51st Division on the 18th and Homs on the 20th. On the same day, inland, the 7th Armoured Division reached Tahuna. The enemy's retirement was by no means unmolested, and there was hard fighting in the Um Raml hills, where the Greys, as the fist of another left-hook by the New Zealanders, had quite heavy casualties.

By the 22nd all attempts to delay our occupation of Tripoli came to an end, and at 5 o'clock on the morning of the 23rd the New Zealand Division entered the town from the south simultaneously with the 51st Division from the east. Both were preceded by elements of the 7th Armoured Division. The honour of being the first unit to enter was once again achieved by the 11th Hussars, closely followed by the 3rd Battalion of the Royal Tank Regiment. This unit's record closely rivalled that of the Hussars. It had fought itself to a standstill in the defence of Calais, at Corinth in the Greek campaign, in the Auchinleck offensive

and around Knightsbridge. Jeanne d'Arc said of her standard, "Il avait été à la peine. Il fallait bien qu'il soit à l'honneur". That applies to the whole of the veterans of the dark days.

The fall of the city three months to the day after the attack was opened at El Alamein is a convenient moment at which to close this part of the story of the Eighth Army. It is true that another fortnight elapsed before the last enemy soldier was cleared from the last inch of the Italian African Empire, but the Eighth Army's independent mission really ended with the fall of the only place which had retained some of the glamour and importance possessed by these provinces in classical times. The Army had still much heavy and successful fighting, such as the Battles of Mareth and Wadi Akarit, before it; but from 20th February it fought as part of the 18th Army Group, and its strategy was controlled from Algiers instead of Cairo.

The campaign here described, however, has conferred upon it imperishable laurels. As an Army it gained the same sort of reputation as has been gained by a few regiments, in that every schoolboy knows it by its number. It is difficult to recall any other British Army of which this can be said, with the possible exception of the Fifth Army, which likewise became a household word in 1918, largely because it was then most unjustly slandered and has since been triumphantly vindicated.

Let us try in a few sentences to summarise how this reputation was achieved. Within three and a half months of sustaining a shattering defeat, this small force gained an even more shattering victory. In three months, twelve days of which were spent in body-to-body battle over a few square miles of desert, it advanced 1,400 miles over terrible country, inflicting some 75,000 casualties on the enemy, and destroying not only his armies but also an Empire and many reputations—chief among them Rommel's. The Eighth Army also made history by solving the terrible problem of how to supply a mass

of rapidly advancing and battling men in arid country possessing only one decent road. On the whole, it is accurate to say that during the whole of the period covered by this account the Army was never short of water, food, petrol, ammunition, or even replacement tanks.

It bettered the enemy's best in three major points of military tactics—the first being the use of armour, the second the combined use of land and air forces, and the third the use of artillery. Even at this distance from the campaign no precise details should be given of the use and control of massed batteries; but there was something new in artillery tactics, and it does far less than justice to the British Command to suggest, as was done at the time, that they "reverted to the tactics of 1914-18". What they did was to think out and apply the principles of war to modern weapons by using methods which, whatever their links with the past, were new in this war. As a result, the myth of the supremacy of German military genius, already attenuated in Russia, was dissipated into thin air. The best tribute to the Eighth Army's exploits, material and moral, is the fact that when Marshal Messe, the Italian C.-in-C., had to surrender in Tunisia, he insisted on surrendering to the Eighth Army and nobody else.

"You are entitled to dwell upon these things," said Mr. Churchill in an address to the troops in Tripoli on 3rd February, "with that satisfaction which men, in all modesty, feel when a great work has been finally done.

"You have rendered a high service to your country and the common cause.

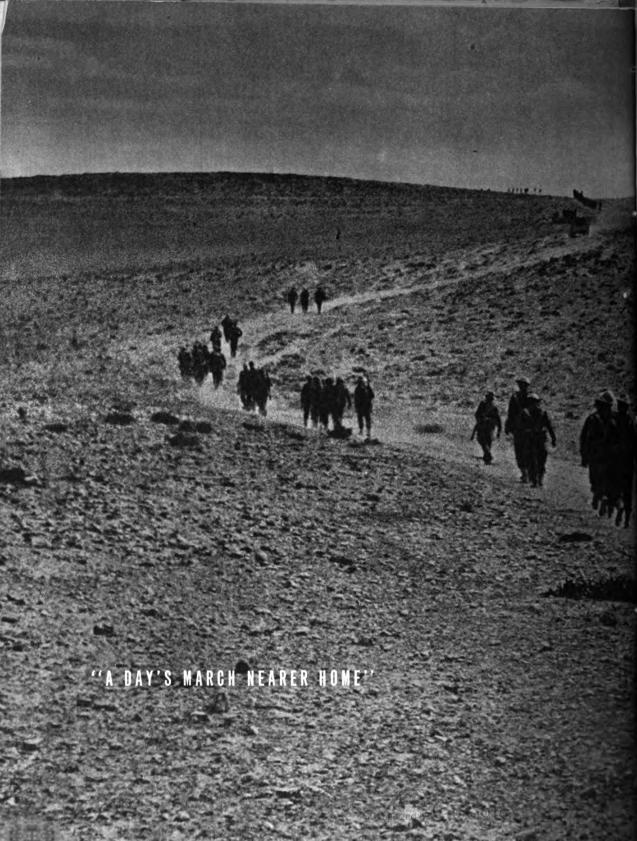
"In the words of the old hymn, you have inightly pitched your moving tents a day's march nearer home."

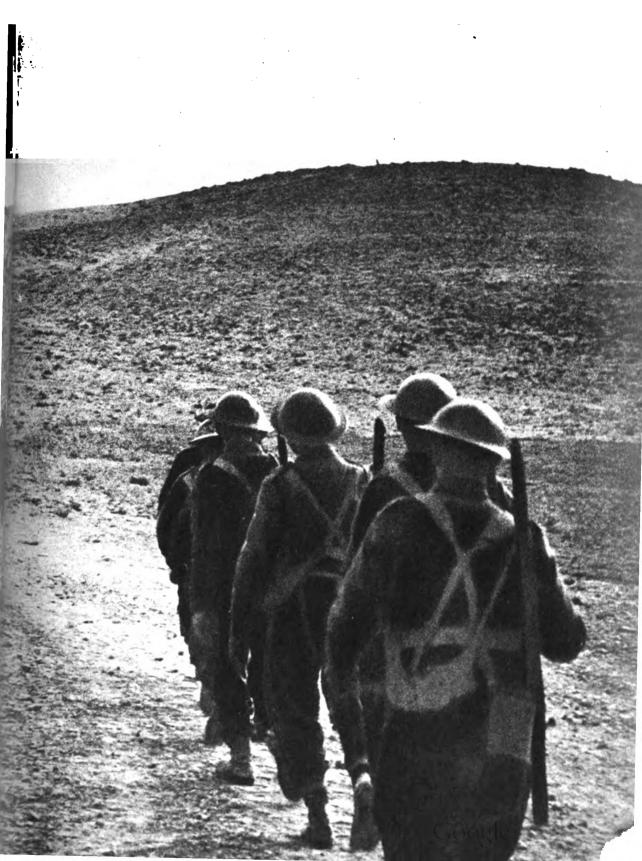
"The achievements of the Eighth Army will gleam and glow in the annals of history.

"The days of your victories are by no means at an end."

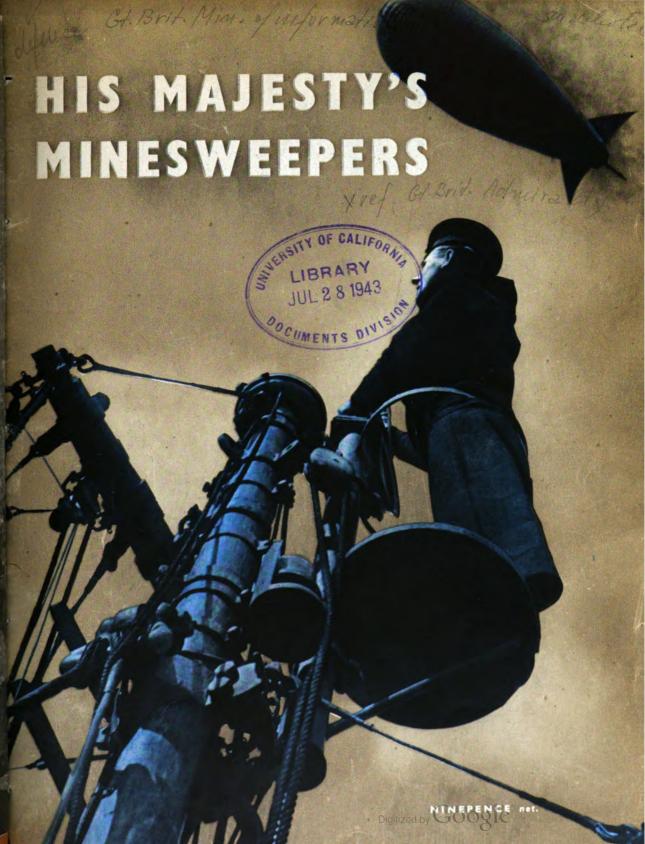
So be it, and so it has been.

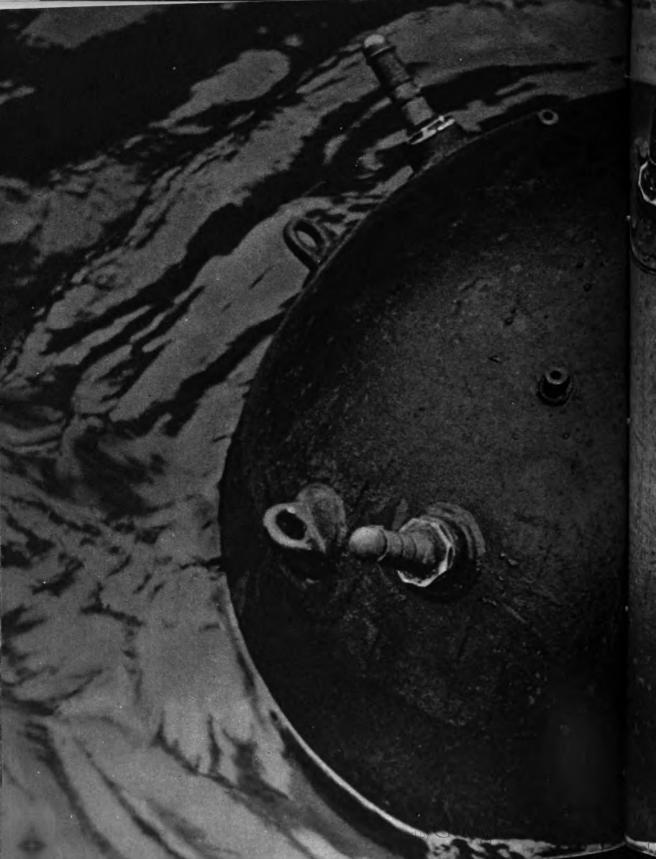




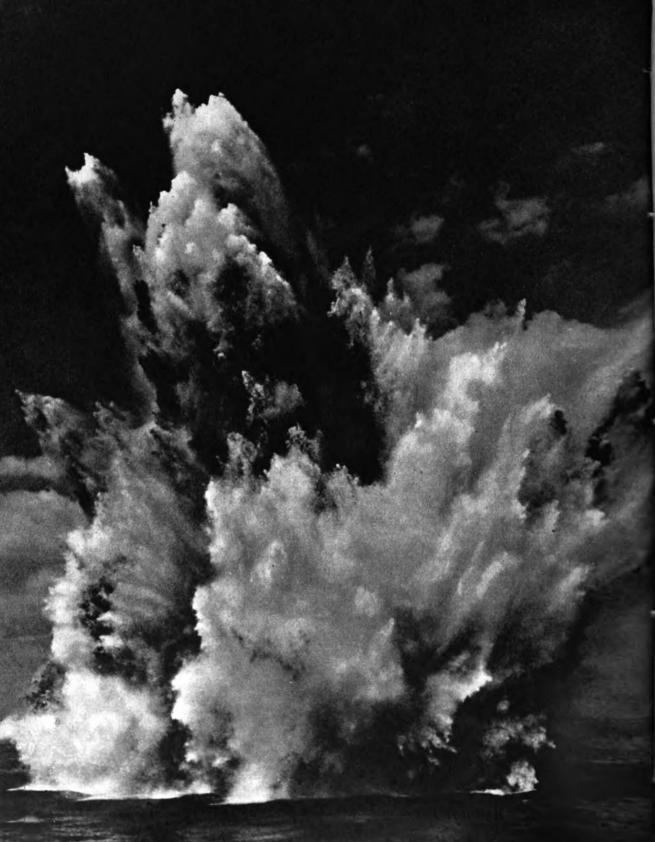












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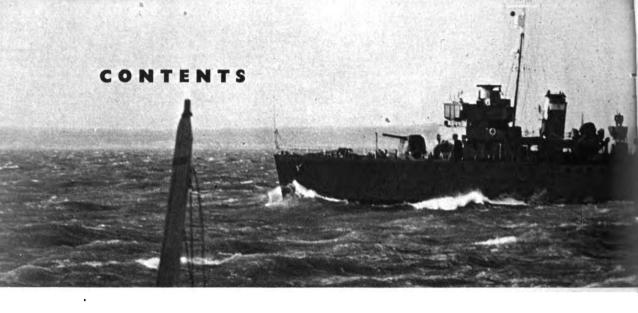
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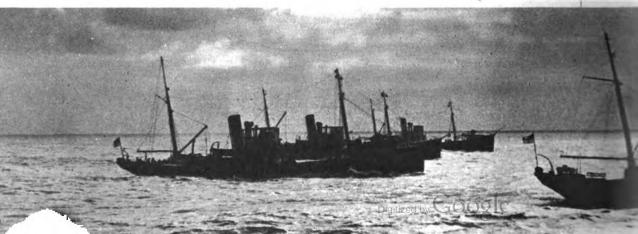
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- 1. ALL THE VALOUR OF A BATTLE-'ORUISER page 6
- 2. "SHIP-DESTROYING ENGINES" page 10
- 3. THE SWEEPERS WIN A FOUR YEARS' BATTLE page 16
- 4. FIGHTING THE SECRET WEAPONS page 22
- 5. THE NEW BROOMS page 30

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THERE ARE MANY MEN AND WOMEN IN THE FORCES WHO WOULD WELCOME A CHANCE O





- & SWEEPING THE WAR CHANNEL page 36
- 7. DANGEROUS AREAS: THE WORK

OF THE FLEET SWEEPERS $\it page~45$

- 6. "OPERATION DYNAMO": THE SWEEPERS AT DUNKIRK page 52
- 9. "UNTIL IT BE THOROUGHLY FINISHED" page 58

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EADING THIS BOOK. IF YOU HAND IT IN TO THE NEAREST POST OFFICE, IT WILL GO TO THEM.



ONLIPER SPALL stood on his upper bridge one blustery morning in February, 1941, conning His Majesty's Trawler Stella Rigel into the War Channel, that buoyed and narrow seaway which encircles the British coast.

The hood of his sand-coloured duffle-coat was pulled over his naval cap, for he had no protection from the sting of the wind or the lash of the spray which was driving over the trawler's bows. He was a Grimsby man, not more than twenty-eight, but in peace-time he had commanded his own ship in the fishing grounds of the North Sea. The experience he had gained was serving him well in his daily search for German mines, and he was proud to wear the King's uniform.

The Stella Rigel was a fishing traveler which, like her captain, had entered the Royal Naval Patrol Service in the early days of the war. Officially she was classed as a "minor war-vessel," but she put to sea with all the valour of a battle-cruiser. For many months she had been sweeping her allotted area, a single unit in that great, tireless fleet of minesweepers which clears the sea-lanes for the convoys to pass in safety, that Britain may have food for her people, and fuel and munitions of war for her fighting forces. Systematically she had plodded to and fro a few miles off the Essex coast, her small company alert for a lurking mine and prepared for attack by aircraft, submarine or E-boat.

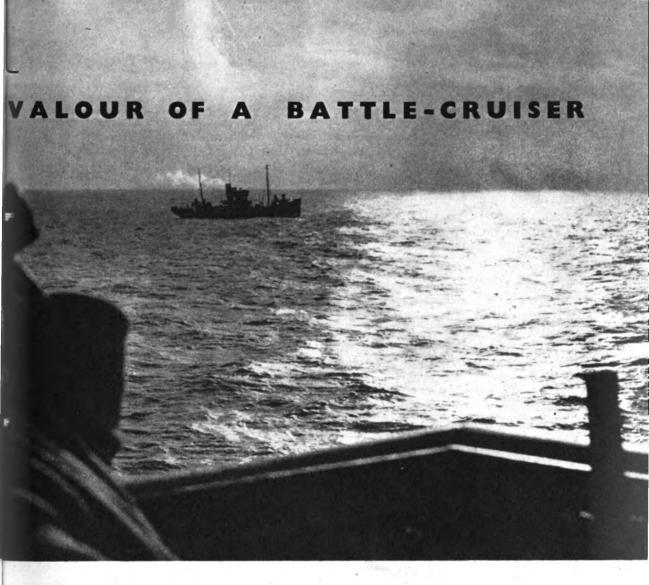
A few of the ratings, like their skipper, were fishermen by trade, but most of them had been landsmen until the outbreak of war. They had learnt to defend themselves as part of the day's work and the night's danger, and they worked as a team, happy in the friendliness of a little ship. Skipper Spall had confidence in them; they in turn looked to the bridge with



equal confidence as they waited for his order that February morning. Once the trawler had reached her position in the War Channel it was not long in coming.

"Hands to sweeping stations!"

There was a scurry on deck as the hands turned to, each man at his place. Everyone in the ship, except the stokers on watch below, prepared to lend a hand. All had their lifebelts on, blown up and ready: in a minesweeper things happen too quickly to take precautions afterwards. They wore blue jer-



seys, overalls, oilskins, and thick white stockings which covered the tops of their long seaboots. The Second Hand took charge of the operations on deck. The Engineman was at the winch on which the sweep-wire was wound. The ratings stood ready to stream the grey torpedo-shaped float which would support the sweep and mark its position in the water. Even the cook left his galley as he heard the Skipper's next order:

"Out sweep!"

The float was lifted from its chocks by the

davit and lowered over the side. There was little room for the men on deck to move, and the rolling of the ship might have sent the heavy float swinging against the bulkhead to crush the fingers of an incautious hand. But the men knew their work, and at an order from the Second Hand, the Engineman unclutched the winch to allow the sweep-wire to veer astern.

As the trawler gathered headway the sweep was taken out 250 yards on to the port quarter by the otter-board suspended from the float,

and the iron kite was lowered to keep the inboard end of the sweep at the required depth. The float was now bounding along 500 yards astern, its red flag visible above a plume of spray. Once again the Stella Rigel had got "all her knitting out." A black ball was hoisted at the masthead and another at the port end of the yardarm to warn other ships of the side on which she was sweeping.

Now the hands could relax, but one was posted aft to watch the float, while the winchman kept his eyes on the taut sweep-wire, ready to go into reverse should he hear it "sing" or see the sudden pull which would reveal that it had caught a mine. From time to time he slacked off a few feet to change the nip and prevent chafing.

All day long the Stella Rigel steamed up and down the War Channel, covering lap after lap, as a man might mow a tennis lawn. Skipper Spall remained on the bridge, navigating the ship with unceasing attention, so that there should be no "holidays" in the swept water where a mine might remain uncut, in wait for an unsuspecting steamer.

The day passed quietly, without a single mine detonating in the sweep or the welcome diversion of one cut from its moorings to be exploded by rifle-fire. From time to time a convoy steamed along the swept channel, a double column of grey merchant ships with their escort of destroyers and corvettes.

Dusk came; then darkness fell over the sea. The Stella Rigel did not put back to harbour, but worked on through the night. The ratings were apt to grumble at the monotony of their task, as seamen will, but they did not underestimate the enemy with whom they had to deal, for they had watched the suffering of their sister ships. They had seen more than one strike a mine and blow up, leaving behind scarcely enough timber to make a packing-case. They had seen a mound of water rising like a mushroom from the surface of the sea, and heard the thud of the explosion as a mine, caught in a sweep, detonated under a trawler's counter. They had seen others of

their kind bombed from the air and sunk, and knew the risk from even a near miss as the ship lifted with the uprush of water, her bows stove in below the water-line.

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Skipper Spall kept a wary look-out as he passed each buoy, well knowing that an E-boat might be hiding in its shadow. He continued sweeping throughout the night, until the end of the Middle Watch-" that weary watch from twelve to four." Then he gave the order "In sweep." Speed was reduced to allow the kite to be hove up and the sweep-wire unsnatched. When the winchman had wound in the sweep, and the float and otter had been stowed, the anchor was dropped clear of the channel, and Skipper Spall told the tired hands to pipe down for a few hours' rest. Then he left the bridge for the first time since the Stella Rigel had put to sea. He did not go down below to his cabin, however, but remained on deck, near the Oerlikon gun which was mounted aft and ready loaded.



There was no moon, and the night was dark. Suddenly he heard the drone of aircraft engines. He ran to the gun. Dark though it was, one of the aircraft seemed to have observed the deeper blackness of the trawler's form as she rode at anchor. It circled her three times, as though investigating, then approached from astern, about 500 feet above the deck.

Skipper Spall did not order "Action Stations," which would have brought his men from their bunks in the fo'csle below. To do that, as he explained afterwards, he would have had to run to the bridge to sound the bell, and by the time the hands had closed up the Heinkel "might have been back in Germany." Instead, he tipped the gun and fired half a magazine at the approaching enemy. He felt that he had sent some shells thudding into the Heinkel's fuselage, and exultantly he let go the rest of the pan in rapid fire. The Heinkel zoomed low over the ship, losing

height, and a few moments later blew up in the sea half a mile ahead. The action had been a matter of seconds, but the hands were astir. The Skipper went for ard and shouted down the companion-way leading to the fo'csle.

"Just come up and have a look at this, lads!"

They tumbled up on deck to watch the Heinkel blazing in the sea.

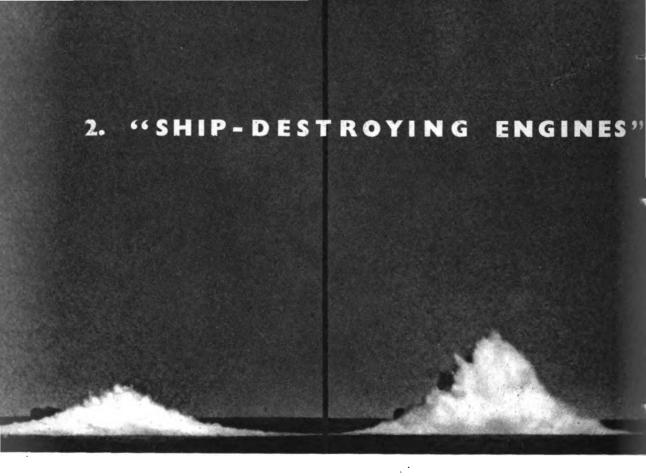
That is how Skipper T. H. Spall, R.N.R., won the Distinguished Service Cross. The story is told here not so much because his action was an outstanding episode of the war, but because it was characteristic of the indomitable spirit of the trawler skippers: tough, brave, enterprising, accustomed to make fair weather of a foul wind, and modest above all.

When Skipper Spall made his report at the Base later in the day he told the Port Minesweeping Officer that there was "nothing to make a fuss about." It had been, he explained, "just a damned lucky do."

FIGHTING SHIP. Trawlers do more than sweep. They fight. With this Oerlikon gun, the Stella Rigel struck down a Heinkel in a night attack in the War Channel. Back in her home port she proudly puts out her coloured badge and painted name. At sea, like other trawlers, she becomes a grey ship with a number.







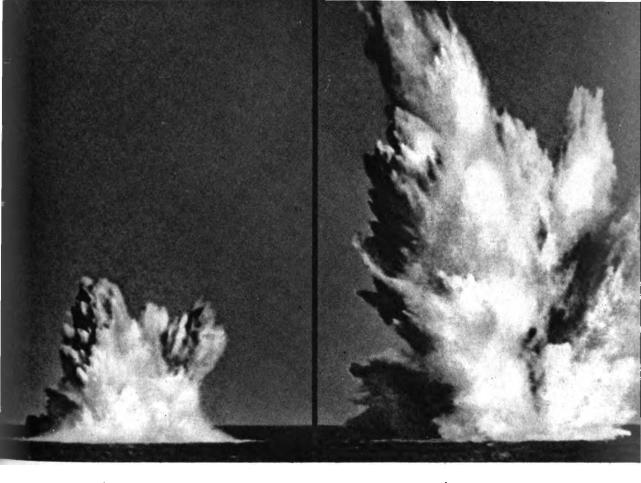
ALTHOUGH THE Stella Rigel and her sister sweepers must be constantly vigilant for some new form of mining offensive, the modern submarine mine is not a new invention so much as the product of four centuries of human ingenuity. During that time the scientists have fought an unceasing conflict of wits as one has produced a destructive device and another has countered it.

It was one of Elizabeth's admirals, Sir William Monson, who first realized that a vessel is more vulnerable below the water-line than above it, although there is no record that he ever carried out his plan for firing a cannon from the hold of a barque which had been laid alongside an enemy ship. But at the siege of Antwerp in 1585 the Dutch destroyed 800

Spaniards by means of a contrivance they called an "explosion vessel" fitted with clockwork mechanism.

Charles I gave his Master of the Ordnance a warrant "for the making of divers watermines, water-petards and boats to go under water," and during the expedition for the relief of La Rochelle in 1628 the Duke of Buckingham, then Lord High Admiral, is said to have used these inventions, although without much success. In Cromwell's time Prince Rupert tried to blow up Blake's flagship, the Leopard, with an explosive machine concealed in an oil-barrel. Twenty years later he was still experimenting with "petards."

"Whatsoever vessel lies by the side of any ship and has the said petard on board, has it



in its power to blow up the other," he assured Charles II.

In 1655 the Marquis of Worcester invented a "ship-destroying engine" which, like the Dutch device, was actuated by clockwork, but it required a diver to attach it to the ship which was to be attacked, and does not appear to have been used. Indeed, the problem which the early inventor failed to overcome was the elimination of the human agency necessary to operate the mine.

It was left to David Bushnell, the American, who has been called the "Father of the Submarine," to evolve the idea of detonating mines by contact. Even Bushnell's early attempts at mining were on the lines of his predecessors, and the object of his sub-

marine, the Turtle, was to approach an enemy vessel under water so that the single operator, while submerged, could drive into the ship's side a wooden screw to which was attached a mine containing 150 lbs. of explosive with a time-controlled mechanism. The Turtle was sunk after an abortive attempt to destroy the British 64-gun ship Eagle in the Hudson River during the American War of Independence, and Bushnell then invented what appears to have been the first contact mine: a keg with conical ends, filled with gunpowder, supported in the water by buoys, and fired by an ordinary gunlock and hammer.

His first attempt with one of these "triggermines" was in 1777 against the British frigate Cerberus while she lay at anchor in the Con-

necticut River, but the mine hit a schooner astern of the Cerberus, destroying her and killing three of her crew. After this Bushnell set a number of kegs afloat on the ebb tide in the Delaware River above the British shipping at Philadelphia. One of them blew up a boat with several men in it, thus giving the alarm which brought on the so-called Battle of the Kegs, when the British troops lined the ships and wharves, firing a wild fusilade at the invisible mines which, beyond causing panic, did little damage.

Twenty years later another American, Robert Fulton, better known as the designer and builder of the Clermont, the first practicable steamship, invented a mine which he called an "explosive carcass" and a "plunging-boat," the Nautilus, from which to fire it. This was the vessel which gave Jules Verne the idea for Captain Nemo's submarine in Twenty Thousand Leagues Under the Sea. Fulton interested Napoleon in his project and the French Government put at his disposal a schooner which he succeeded in blowing up.

His methods did not appeal to the chivalry of the French naval officers, however, and he betook himself to England, where he placed some of his other inventions before the Admiralty. One of these was an explosive magazine known as a "catamaran," an oblong wooden vessel containing 40 barrels of powder. The withdrawal of a safety-pin caused a clockwork mechanism to revolve for ten minutes, then a gunlock hammer was released and hit a percussion cap, the flash causing the magazine to explode.

The possibilities of this device impressed the Admiralty and in 1804 Lord Keith used it against the French fleet off Boulogne. The catamarans were set adrift in pairs, but they were too close to the surface to be effective and the columns of water caused by the explosions made no impression on the stoutly-built French ships. The French protested indignantly against this method of attack.

In the following year, a few days before the

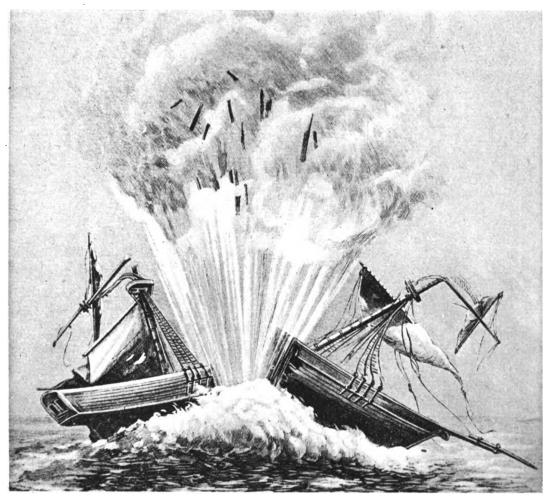
Battle of Trafalgar, Fulton gave a demonstration of another explosive device for the benefit of Mr. Pitt, who provided him with a strong Danish brig, the Dorothy, as a target ship. The brig was anchored off Walmer Castle, Pitt's residence, and was attacked by a carcass containing 170 lbs. of powder. A naval officer who was present remarked cheerfully that if such a contraption were placed under his cabin while he was at dinner he would feel no concern for the consequences. A few moments later the explosion lifted the brig almost bodily out of the water and she broke in two.

"She did not appear to make more resistance than a bag of feathers," wrote Fulton, "and went to pieces like a shattered eggshell."

Nothing came of the experiment, however, and Lord St. Vincent probably voiced the opinion of most naval officers when he declared that "Pitt was the greatest fool that ever existed to encourage a mode of war which they who commanded the sea did not want, and which if successful would deprive them of it."

Fulton retired discomfited to the United States. He had proved the possibilities of submarine mines, but they were not used effectively until war broke out between Germany and Denmark in 1848, when Professor Himmly, unaware of either Bushnell's or Fulton's work, invented a mine which could be detonated by electric contact from the shore. These mines, the first to be laid as weapons of defence, were used to protect Kiel against the Danish fleet. The Russians also laid mines to defend the ports of Sebastopol and Kronstadt during the Crimean War.

In the American Civil War the Confederates tried to equalize their inferiority in ships by minelaying, and although not a single vessel on either side was sunk by gunfire, nearly thirty were destroyed by contact mines. Some were made of beer-kegs with chemical fuses; others were truncated tin cones with gunpowder in the lower end and on the top an

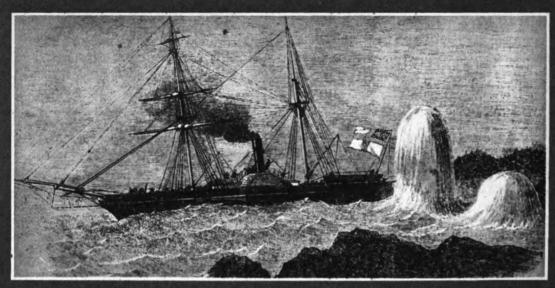


"NO MORE RESISTANCE THAN A BAG OF FEATHERS." So wrote Robert Fulton after William Pitt had let him explode a form of mine he had invented under the anchored brig Dorothy. This experiment was in 1805, a few days before Trafalgar.

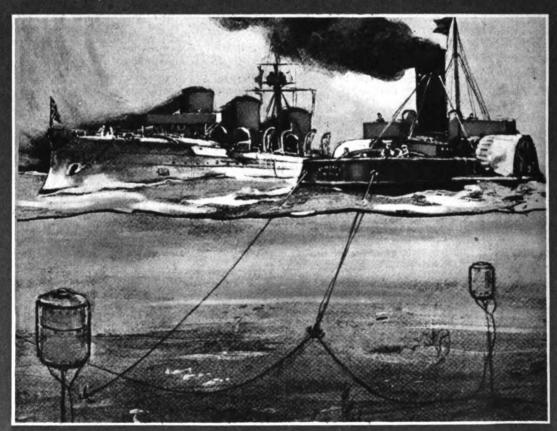
iron cap which was displaced on contact and pulled a friction tube, thus detonating the charge.

The most elaborate minefield of the war was a triple line laid before the fort of Mobile, which Admiral Farragut attacked in 1864. The monitor Tecumseh, leading the fleet, struck a mine and sank by the head, taking with her the captain and a large number of

her company. More mines were reported ahead and the Admiral was faced with the alternative of ignominious retreat or taking his fleet through the danger zone. Undaunted he chose to advance and gave the order for full speed. Seldom has courageous decision been better justified by result. Although the mines could be heard bumping against the sides of the ships and grazing along their



INFANCY OF THE MINE. Water-spouts from Russian mines astound the crew of the British warship Merlin, damaged in a minefield off Sveaborg during the Crimean War.



THE FIRST SWEEPERS. A Japanese minefield is swept with grappling hooks from the stern of a Russian tug during the Russo-Japanese War, 1904. The cruiser Novik stands by. Both Russian and Japanese heavy warships were sunk by mines during the war.

bottoms, not one exploded and the fleet went through unscathed:

When the Confederates first began to lay mines the Federals professed to be as indignant as the French had been, but before hostilities were over they too had adopted this method of warfare. Immobile contact mines were also used by Paraguay in 1868 during the war against Brazil, and sank the Brazilian ironclad Rio Janeiro. During the Franco-Prussian War the Germans prevented the French from attacking their principal ports by defending them with contact and electrically-controlled mines.

The mine continued to be regarded as a weapon of defence until the Russo-Turkish War, when in May, 1877, a small party under a Russian lieutenant swam across the Lower Danube towing an electro-controlled mine, which they placed under the bottom of the Turkish monitor Dar-Matoin. When the mine was fired the ship was blown to pieces and not a man on board was saved.

This was an isolated incident, however, and although the Russians are said to have been the first to sweep for mines—by towing weighted hawsers between a pair of tugs—when war broke out with Japan they confined themselves to protecting Port Arthur by an extensive minefield, on which their own armed minelayer, the Yenisei, was sunk.

Five years previously, however, an Italian officer had invented a mine designed to be laid outside enemy ports for purposes of blockade, and demonstrated in naval manœuvres that fleets could be forced over mined areas. It may be that the imitative minds of the Japanese adopted this idea, for they laid a line of mines outside the Port Arthur field. A decoy squadron then lured the Russian admiral out of the harbour, with the result that the flagship Petropavolosk struck'two coupled mines and sank within three minutes. This was the first ship to be destroyed by a minefield laid in anything but defence, and other casualties followed. The Russians retaliated by laying mines in the open sea and sank two Japanese battleships in a single day.

The mine thus became recognized as a weapon of aggression, and the Germans were not slow to mark the lessons of the war. They carried out elaborate experiments, made preparations for manufacture, and drew up plans for widespread minelaying in the event of a naval war.

The British Admiralty was slower to act, not realizing the potency of the mine in the hands of an unscrupulous enemy and relying on the Hague Convention which stipulated that mines might be laid only in the territorial waters of an opponent. It was supposed that naval patrols would be able to deal with any surface minelayers which approached the coast, and no one appears to have suspected that minefields could be laid by submarines.

Nevertheless, Admiral Lord Charles Beresford foresaw the need of providing shipping with adequate protection against minewarfare, and after a visit he paid to the East Coast ports in 1907 when Commander-in-Chief of the Home Fleet, he recommended the use of Grimsby trawlers for minesweeping. He argued that in time of war many vessels of the fishing fleet would be inactive and therefore available for war service. Fishermen were more skilled than naval ratings in the handling of wires and trawls, and the employment of trawlers would free the small naval craft for other duties.

The Admiralty hired two trawlers with their fishing crews, and sent them to Portland for minesweeping experiments. These trials were successful, and shortly afterwards the Trawler Section of the Royal Naval Reserve was formed. Arrangements were made for 100 trawlers to be mobilized on the outbreak of war and for the immediate enrolment of 1,000 officers and ratings. The rank of Skipper, R.N.R., appeared in the Navy List for the first time.

There was no lack of volunteers for the new Service. It was to be some years before they were needed, but Lord Charles Beresford's foresight was justified when the time came. 1914, Germany immediately showed that she relied on the mine as a weapon of offence. Within a few hours of the declaration of hostilities a British trawler sighted the Königin Luise, a small converted mailsteamer, laying mines thirty miles off the coast of Suffolk. British destroyers sank her, but the following morning the cruiser Amphion struck one of her mines and went down with the loss of 151 lives.

The regular minesweeping force then consisted of no more than six old torpedogunboats. But the Reserve was being mobilized, and by 8th August, 1914, fishing trawlers were at sea, sweeping for mines, manned by their ordinary crews of fishermen. Within a fortnight another hundred trawlers had been requisitioned. So eager was the fishermen's response that in eleven days the whole force was manned and fitted out at Lowestoft.

By the end of August a clear channel had been swept and buoyed, inshore of the minefield laid by the Königin Luise. This was the beginning of the War Channel which eventually extended from Dover to the Firth of Forth, a distance of 540 miles, and was swept daily. The forces employed on this service were based on the Nore, Harwich, Lowestoft, the Humber, the Tyne and Granton in the Firth of Forth.

The mines with which the sweepers had to contend were globular or pear-shaped, some three feet in diameter, containing about 350 lbs. of guncotton, trinitrotoluene (T.N.T.) or amatol. This explosive, with the firing batteries, occupied about half the space available, the remainder being used as an air chamber to give buoyancy to the mine. On the upper surface were five or more leaden horns five inches long, each holding a glass tube containing a chemical mixture. Contact with a ship fractured the horn and smashed the glass tube; the released liquid then energized the battery, which fired the detonator. On one occasion a whale was killed by hitting the horn of a mine.



When the laying vessel dropped the mine, both the mine and the sinker to which it was attached went straight to the bottom. After a short interval, which allowed the ship to steam clear, the mine was automatically released and rose under its own buoyancy, unreeling its mooring wire, while the sinker remained below. The depth of the mine beneath the surface was regulated by a device called the hydrostat, which gripped the mooring wire when the mine had reached the required height.

The trawler's task was to cut this mooringwire so that the mine would either detonate in the wire sweep or rise to the surface, when

SWEEPERS WIN A

FOUR YEARS' BATTLE



it could be exploded or sunk by rifle-fire. To facilitate cutting, the Admiralty introduced a serrated wire, the effect of which was to saw through the cable. The sweep-wire was towed between a pair of trawlers about 400 yards apart, and held beneath the surface by a heavy kite, which dived under the water when in motion, just as an air kite rises in the wind. In order to cover as wide a front as possible two or more pairs of trawlers might work together.

Germany began her minelaying campaign with a flying start. She is known to have laid 600 mines off the East Coast alone by the end of August, 1914. Of these, the gallant

trawlers had been able to account for only twelve, at a cost of six ships and over half their crews. During the first two months of the war one trawler was sunk for every five mines swept.

It became clear that while the trawlers were invaluable for the routine sweeping of the traffic lanes, their average draught of 14 feet made them too vulnerable for clearing minefields. For this purpose the Admiralty requisitioned a number of excursionist paddle-steamers, which were moderately fast and drew comparatively little water, while the torpedo-gunboats—little coal-burning ships of 800 tons and more than 20 years old—were





A THOUSAND LITTLE VESSELS like these fought the German mine campaign in 1914-18. The cost was high. One sweeper a week was sunk. But the mine was beaten. Left, paddle-minesweepers at Harwich. Right, armed trawlers in the North Sea.

attached to the Grand Fleet, preceding the capital ships when they put to sea and searching areas where mines were expected.

The first twelve of the regular war-built minesweepers, the Flower class, were ordered on 1st January, 1915, and thereafter their construction proceeded fast. As the war went on, 400 trawlers were built for the Admiralty; others were bought from Norway, Holland and Spain. The minesweeping force expanded , so rapidly that it became impossible to man it with fishermen alone. Officers of the Royal Naval Reserve and the Royal Naval Volunteer Reserve joined the Service, while the ratings came from all walks of life and many parts of the Empire. In October, 1917, the operational side was brought under a single head when Captain (now Admiral Sir G. Lionel) Preston was appointed Superintendent, and later Director, of Minesweeping, which position he held until the end of the war, and subsequently when he was in general charge of mine clearance.

As the organisation grew, so did the menace of the mine increase. In June, 1915, the Germans began to use submarines for mine-

This increased the strain on the laving. minesweeping forces at Harwich, the Nore and Dover, the first areas to be affected. By the end of 1915 the outlook was black. It became even graver as the months went by. In June, 1916, H.M.S. Hampshire, with Lord Kitchener on board, was sunk off the Orkneys by a mine which the U.75 had laid. As larger U-boats came into commission mines were laid farther and farther afield. The trawlers followed them. Their task was made harder still by the delayed-action mechanism which could keep a mine attached to a sinker for any period up to 30 days, so that some channels had to be swept repeatedly before it was certain they were clear.

At last a protection against moored mines was found. This was the paravane, invented by Lieutenant (now Commander Sir Charles) Burney, R.N. It was simple, inexpensive, and sure: a buoyant, torpedo-shaped body of welded steel, 12 feet long, fitted with horizontal rudders to keep it at the required depth. A pair of these devices was towed from the ship's forefoot, streaming out at an angle of 50 degrees on either bow. The towing wires

acted like sweeps when they came in contact with a mine-mooring and protected the whole breadth of the vessel.

Extreme secrecy was preserved about this invention, and although the Germans became perturbed at the increasing immunity of ships in mined areas, they did not discover the reason until after the war. To-day all naval vessels, and all merchantmen whose course lies in waters likely to be mined, carry paravanes, which cannot, however, protect them against ground mines.

The unrestricted U-boat campaign of 1917 was accompanied by a vast increase in submarine minelaying off the British coast. Among the victims was the armed merchant-cruiser Laurentic, which struck a mine off Lough Swilly and sank in 40 minutes with gold to the value of five millions sterling. It was estimated that the Germans laid one mine every hour in British waters. In April alone 515 were swept, a total which far exceeded that for any previous three months of the war; but the cost was heavy: the losses were one sweeper a day for the greater part of that month.

To meet the attack the Admiralty took over every available paddle-steamer and motor fishing-boat, while aircraft and motor-launches were used for locating minefields at low water. By the end of the year over 1,000 miles of coastal water off Great Britain and Ireland were being swept.

On one occasion, off the south-west coast of Ireland, the sweepers merely went through the motions of clearing a dangerous area, left it intact, and steamed back to harbour to await results. It may be that the Senior Officer of the flotilla had in mind Psalm xxxv, verse 8: "Let a sudden destruction come upon him unawares, and his net that he hath laid privily catch himself: that he may fall into his own mischief." At all events it was not long before the captain of the U.C.44, under the impression that the field had been cleared, began to relay it. His submarine was blown up by one of

his own mines and he was rescued by a naval patrol. He is said to have been indignant at the inefficient manner in which the British sweepers had done their work.

Enemy minelaying was not confined to German submarines laid British waters. mines off the coasts of France, Portugal, West Africa, the United States and Nova Scotia. throughout the length and breadth of the Mediterranean, and in the approaches to Murmansk and Archangel. The Turkish mines at Gallipoli, laid for defensive purposes, achieved their object by preventing the British fleet from forcing the Narrows. German surface-raiders, notably the disguised merchant vessel Wolf, laid mines as far afield as the Cape of Good Hope, Ceylon, Australia and New Zealand.

Germany had intensified mine-warfare as part of her policy of destroying British sea-borne trade. But the lessons of history, particularly those of the Napoleonic Wars, when the French pursued the same end, show that commerce-raiding cannot win a war without command of the sea. Germany never secured that command, although during the spring of 1917 she came near to doing so. By the beginning of 1918 the inexorable pressure which the Royal Navy had been exerting for over three years was having its effect, and long before the Armistice British minesweeping had won the mastery over German minelaying.

By November, 1918, the force which had been improvised from old gunboats saved from the scrap heap, fishing craft, and a few excursion steamers, had been expanded into a fleet of over a thousand vessels, stationed at 26 ports at home and 35 abroad, manned by a highly-trained body of men whose life was one of instant readiness, sleepless nights, hard lying, constant vigilance in stormy seas, and the strain of unseen danger.

Besides clearing the path of the merchantmen, the sweepers were always ready to help a ship in distress and their devotion to duty saved many lives. In December, 1917, the hired turbine-steamer St. Seiriol, while sweeping off the Essex coast, sighted the Frances Rose of Liverpool heading straight for a mine 400 yards ahead. It was about two hours before low water, blowing hard, with a heavy sea. Slipping her sweep, the St. Seiriol headed across the Frances Rose's bows and ordered her to anchor. The extent of the minefield was unknown. Patrol craft and trawlers were sent north and south to stop all traffic, but a few minutes later the Frances Rose struck a mine. The St. Seiriol went alongside the sinking vessel and took off all hands. By that time three mines were showing on the surface. The Commanding Officer gave the order "Stand by to blow up." But the St. Seiriol remained untouched (although sixteen mines were subsequently swept up in the area) and she proceeded to port at high tide.

The sweepers' losses were severe: 214 were sunk during the war, an average of one a week. Moreover, when the Armistice came the minesweepers' work was not ended, for there remained the task of clearing the unswept minefields which had been laid by the Allies and the enemy. That entailed a close search of 40,000 square miles of sea.

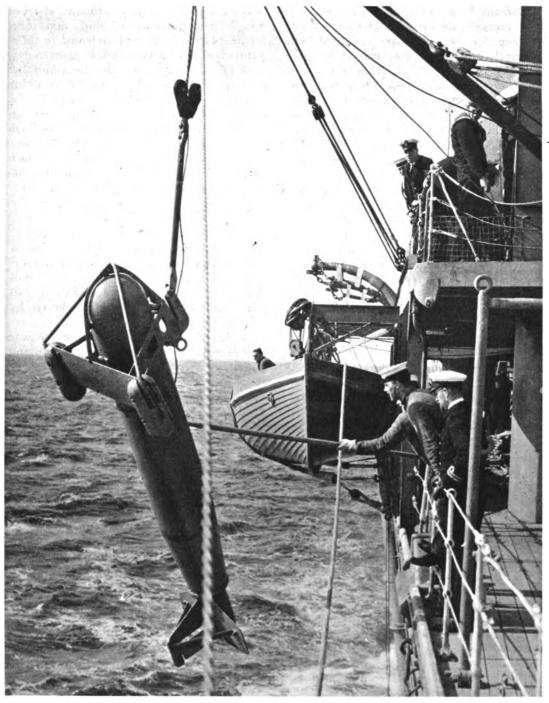
The Admiralty appointed an International Mine Clearance Committee, on which 26 countries were represented. The Supreme War Council allotted each Power an area to clear, the largest falling to Great Britain. A special Mine Clearance Service was established in February, 1919, with special rates of pay and conditions of leave. There was no lack of volunteers, and the work was completed by the end of November, by which time 23,000 Allied and 70 German mines had been swept, with the loss of only half-adozen sweepers. In the meantime, the Americans had cleared the Northern Barrage between the Orkneys and the Norwegian coast, where 56,033 American and 15,093 British mines had been laid by the end of the war over an area of 6,000 square miles.*

When the clearance was finished the inevitable cutting down of ships and men began. The trawlers were released to their owners and returned to the fishing grounds: those which had been built for the Admiralty were sold, together with many of the older fleet sweepers, others being broken up or placed into reserve. No fleet minesweeping flotilla was maintained in full commission, and the Minesweeping Division at the Admiralty was disbanded. Later, one flotilla of fleet minesweepers was commissioned for the instruction of junior officers and ratings, and on the re-introduction of training in the Trawler Section of the Royal Naval Reserve, renamed the Royal Naval Patrol Service. three trawlers were attached to this flotilla and fortnightly courses were begun at Port-But no fast sweepers were built until 1933, when four of the Halcyon class were laid down; these were relieved by more modern vessels in 1939.

During the uneasy years before the war increasing attention was paid to training both officers and ratings and to minesweeping development. Technical investigations were made, sweeping trials were carried out with live mines, and improvements were made to the Oropesa sweep, which had come into use in 1918, being called after the ship in which it was first tried.

In the summer of 1937 the 1st Mine-sweeping Flotilla was employed on the Non-Intervention Patrol in Spanish waters. In the following year large-scale minesweeping exercises were arranged, and in June, 1939, a handling trial of a magnetic sweep—to be known later as the "Bo'sun's Nightmare"—was carried out. This shows that the Admiralty was not caught completely off its guard by the offensive that was shortly to be hurled against British and neutral shipping, although few realized how serious would be the onslaught when it came.

^{*}For a fuller account of the work of the minesweepers in the war of 1914-1918, see Swept Channels, by Capt. Taprell Dorling, D.S.O., R.N.



THE SHARK-SHAPED PARAVANE, invented in 1917 and kept secret from the Germans, gave warships and merchantmen their own protection against mines. One to port, one to starboard, they were streamed out at an angle from the bows at the end of cables that cu (through mine moorings.

Patrol Service was at her war station by the end of August, 1939. During the summer, the Admiralty had bought 67 trawlers and had ordered twenty new ones from the shipyards. Others were taken over as they returned from the fishing grounds. As one naval officer said, "They threw the fish out and threw us in."

In every war since the days of Elizabeth, Britain has suffered from an initial shortage of small ships. But whereas the emergencies of 1914 had demanded improvisation, in 1939 those lessons had been learnt and plans had been made from the experience garnered. There was, moreover, an invaluable nucleus of officers and ratings who returned to the Service with practical knowledge of mine-sweeping in war, and also a number of patriotic and enthusiastic R.N.V.S.R. amateur yachtsmen who had learnt the elements of minesweeping during their holidays with the 1st Minesweeping Flotilla at Portland.

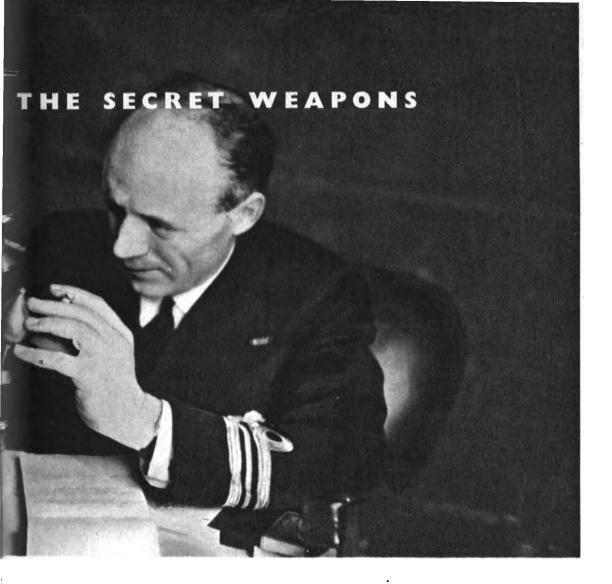
The Minesweeping Division at the Admiralty once again became responsible for all vessels and material. The Director and his staff collected and disseminated intelligence regarding enemy minelaying, gave advice on tactical counter-action, and laid down the searched channels through which shipping might pass. In the Operations Room a permanent watch plotted the movements of the sweepers and recorded the position of every mine that the enemy was known to have laid, and of every ship known to have been mined.

At each Naval Base a Port Minesweeping Officer took command of the trawlers which swept the new War Channel. On a mine being reported or swept, the position was buoyed, the local traffic diverted, and, if necessary, the port closed. If mines were found in the War Channel, the convoys were kept back until the dangerous area had been cleared. A priority message was sent to the



Minesweeping Division, where its information was checked and then broadcast to all shore stations and ships at sea. Patrol vessels were posted near the dangerous area to warn merchantmen which might not have received the message. Whenever possible, the masters of sunk or damaged ships were interviewed as soon as they came ashore.

The first ship to be mined in the present war was the British steamer Magdepur, which blew up and sank off the East Coast on 10th September, 1939. Six days later



the City of Paris struck a mine but escaped with little damage. As the weeks passed losses became more serious, and statements made by a prisoner of war revealed that the enemy was discharging magnetic mines from submarines. This evidence appeared to be confirmed by a number of unexplained explosions and sinkings off the coast.

Hitler had boasted of his "secret weapon" and it seemed that this might be the magnetic mine. It was not, however, a new invention, for the Royal Navy had used magnetic mines

off the Belgian coast during the previous war, and, so far from its being a secret, an American citizen, Mr. Cæsar Marshall, had been granted a British patent for such a device in 1918. Other inventors had experimented with mines of similar type, and the Mine Experimental Department of H.M.S. Vernon was well aware of their existence; indeed, its own magnetic mines were in an advanced state of development.

The magnetic mine is so called, not

because it is attracted to a ship's hull, but because it is detonated by a magnetic needle which becomes active when a large mass of iron passes into its field. When the mine is laid on the sea bottom it can operate only in comparatively shallow water, but within its range it can cause far more damage than the moored mine, since the moored mine blows a hole in a ship, usually for'ard, which may be localized, whereas the explosion from a ground mine strikes the vessel under her bottom amidships, opening up the plating of the hull, shattering the machinery and the pipes, and frequently breaking her back.

Against this weapon neither the existing

NECKLACE OF MINES lying round the deck of a German minelayer in the North Sea. It is September, 1939; the attack has begun. The crew stands ready.



sweeps nor the paravane availed. But counter-measures were taken, first with the "Bo'sun's Nightmare," which was still in the experimental stage. This was a wire sweep to which a number of magnetized bars were attached and towed between two ships just off the sea bottom. Large electro-magnets and barges with coils of wire were also used; even aircraft were employed. magnetic mine was detonated in the Bristol Channel, but although the sweepers were rapidly fitted with new devices and the officers given instruction in their use, none was wholly satisfactory and the sinkings continued at an alarming rate.

A doctor cannot prescribe a remedy until he has had the opportunity of diagnosing the disease, and the officers of the Mine Experimental Department of H.M.S. Vernon could not find the effective antidote to the magnetic mine until they had studied a specimen and discovered its mechanism. Every effort was made to recover a magnetic mine intact, but for some time without success.

Then it appeared that the enemy was dropping the mines from aircraft. This was all the more serious, because it rendered our own mine barrages, which were a protection against surface-layers and submarines, of no avail. Between 18th and 22nd November, fifteen merchant ships were mined, including the Japanese liner Terukuni Maru and the Dutch steamer Simon Bolivar. H.M.S. Belfast was damaged and the destroyer Gipsy sunk.

The danger to shipping had suddenly become intensified, and it seemed that merchant traffic would be paralysed unless the remedy could be found. The men in the sweepers did all they could, but they were powerless against this weapon new to their experience. They looked to the scientists to give them the means to combat the offensive, but that the scientists could not do until they had discovered exactly what they had to fight.

The first definite evidence that the enemy

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mines were being laid from the air came on the night of 21st November, when aircraft, believed to be Heinkel 115s, operating from bases on the islands of Sylt and Borkum, were seen to drop mines in the Humber and in the estuaries of the Stour and the Thames. Observers reported that the mines looked like sailors' kit-bags suspended from parachutes. Officers from H.M.S. Vernon were sent to East Coast ports to investigate. They could discover no further information. None came in next day. The situation had become very grave. Shipping in three rivers was held up. The Minesweeping Division at the Admiralty and all officers ashore and afloat were working under a severe strain. But as yet there was no conclusive proof of the nature of the mine.

Shortly after midnight on the morning of the 23rd, Lieutenant-Commander J. G. D. Ouvry, R.N., of H.M.S. Vernon, was called to the Admiralty from the London hotel where he had been awaiting such a summons. He packed his bag immediately and reported to the Director of Minesweeping. He was told that at ten o'clock that night sentries at Shoeburyness, on the Thames Estuary, had seen a German aircraft drop an object into the sea near the beach. At first they believed the dark shape to be a parachutist. They waded out into the water to investigate, but the incoming tide forced them back. A report had been made to the naval authorities, who realized that the chance of recovering a magnetic mine intact had come at last. Lieutenant-Commander Ouvry was told that the mine should be uncovered at low water, which would be at 4 a.m. A car was waiting to take him and Lieutenant-Commander R. C. Lewis, R.N., also of H.M.S. Vernon, to Shoeburyness. Their orders were to examine the mine and recover it at all costs.

Two hours later they were met at Shoeburyness by a naval Staff Officer, a party of soldiers equipped with lights, ropes and stakes, and two photographers. It was a dark night, and rain was falling. In the river a



THE "BOSUN'S NIGHTMARE", so called because of its tangles, was the first answer to the magnetic mine. The cylindrical bar is the sinker. Oval-shaped floats are called "blobs." The wire sweep is magnetized.

large company of ships lay at anchor, unable to sail until the channel had been cleared of the unknown. A frozen-meat ship had caused a mine to fire as she swung to the turn of the tide.

Led by one of the soldiers, the party set off in the darkness, splashing through the pools left by the ebbing tide. At length the light of the torches revealed a black object lying partially embedded in the sand. The two officers advanced to the attack, while the soldiers in the rear illuminated the mine with an Aldis signalling-lamp.

They found the mine to be cylindrical in shape, about 7 feet long, made of some aluminium alloy, with tubular spokes on the nose and a hollow tail containing a massive bronze spring for projecting the parachute. There were two sinister fittings near the fore end. One was evidently a hydrostatic valve. The other was impossible to identify. It was made of polished aluminium and secured by a screwed ring sealed with black wax. As this fitting seemed more likely to harbour a

primer and detonator, Lieutenant-Commander Ouvry decided to tackle it first.

Lieutenant-Commander Lewis took an impression of the securing ring on a sheet from a signal pad in order that a brass (non-magnetic) spanner might be made to unscrew it. Flashlight photographs of the mine were taken from all angles, and measurements made for purposes of description. It was then decided to wait until noon, when the mine would be again uncovered, and the soldiers tenderly lashed it down with the ropes and stakes. On their way back to the car the party came upon the parachute spread out on the sand. It was made of white silk and took eight men to drag it above high-water mark.

At 6 a.m. the Vernon officers had just finished breakfast when they received a message that another mine had been sighted about 300 yards from the first. They immediately set off again and waded out in the deepening water to find it. The occupant of a moored hulk nearby told them that it had been submerged for some minutes, and they decided to wait for the falling tide.

A preliminary report was then framed and sent by car to the Admiralty, together with copies of the photographs which had been developed and printed. At one o'clock both mines were uncovered. By that time the special mine-recovery party had arrived from H.M.S. Vernon, with Chief Petty Officer C. E. Baldwin in charge, bringing a set of non-magnetic tools as an addition to those which had been made at Shoeburyness during the night. A tractor lorry with a crane fitting was kept in readiness in a sheltered position on the foreshore. While daylight photographs were being taken of the first mine, the officers examined the second; it was found to be on a different slew from the first, with its nose inclined downwards, and was more battered.

It was then arranged that Lieutenant-Commander Lewis and Able Seaman A. L. Vearncombe should remain on the foreshore while Lieutenant-Commander Ouvry and

Chief Petty Officer Baldwin tackled the first mine. Lieutenant-Commander Ouvry outlined a definite sequence of events, which the others would be able to observe clearly from the distance—"in case of a mistake on my part," as he put it.

He and the Chief Petty Officer then set out across the sand, having first emptied all metal objects from their pockets. It has been said that they volunteered for the task of rendering the mine safe. There was no question of this. It was the work for which they had been trained, the work which they had been waiting to do for weeks. Whatever their feelings may have been, they accepted the risk, serious though it undoubtedly was. They had no means of knowing whether the mine had some special trap that would cause it to detonate should an attempt be made to dissemble it. They were like men who advance along a jungle path which may well be ambushed. But both were experts at their work; and they had their courage.

They started on the aluminium fitting on the upper part of the mine. The keep-ring unscrewed easily and there was no difficulty in raising the fitting. This Lieutenant-



Commander Ouvry did, however, with the greatest caution, since he believed he was handling either a detonator or some sort of magnetic needle. It proved to be a detonator.

Confident that this operation had removed the principal danger, he summoned Lieutenant-Commander Lewis and A. B. Vearncombe to help him turn the mine so that he could reach the fittings hidden by the sand. This they accomplished without mishap, and a second detonator was discovered, of a type similar to that of the German horned mine. The fangs had now been drawn.

"We felt on top of the world!" wrote Lieutenant-Commander Ouvry afterwards.

By 4 p.m. they were satisfied that they had made the mine innocuous. It was hoisted on to the lorry, for despatch with the parachute to the Vernon the following morning, and an hour later a report was made to the Admiralty that the mine had been recovered intact. Lieutenant-Commander Lewis returned to London that night, and at 11 p.m. attended a Board of Admiralty conference at which the First Lord, Mr. Winston Churchill, heard the full details.

7

The mine reached the Vernon next day.

Its total weight was 1,128 lbs. and it carried an explosive charge of 660 lbs. in the fore end. The conical stern became detached when the aircraft dropped the mine, thereby releasing the parachute. When stripped down by the experts of the Vernon its mechanism proved to be what one of them called "a scientist's paradise." Mr. Churchill had given orders that work was to proceed night and day until the answer had been produced. In twelve hours the solution was passed to the Admiralty: it was indeed a magnetic mine, and all its secrets had been laid bare.

Lieutenant-Commanders Ouvry and Lewis were awarded the D.S.O., C.P.O. Baldwin and A.B. Vearncombe the D.S.M. Lieutenant J. E. M. Glenny, R.N., who rendered the second mine safe, received the D.S.C.

The recovery of these mines was not only among the most gallant deeds of the war, but was a turning-point in the long and bitter conflict between minesweeper and minelayer. Hitler had relied on the magnetic mine to destroy the British mercantile marine. It is on record that Captain Hans Langsdorf, of the Graf Spee, assured his prisoner Captain Patrick Dove, master of S.S. Africa Shell,

that Germany regarded it as the secret weapon which would be the decisive factor in winning the war. He declared that it had been invented eight years previously and that since then the cleverest German technicians had failed to find the antidote.

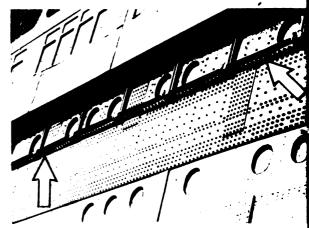
"Now the British Navy has to start where we began eight years ago," he said.

But what one man's brain can contrive, another's can resolve. There is a parry to every thrust, an antidote to every poison, once the analysis has been made, and as soon as the secrets of the magnetic mine had been discovered it was possible to provide the counter-measures.

A new sweep was evolved, the principle being to create a magnetic field which would activate the needle of the mine, and the sweepers soon began to achieve satisfactory results. Moreover, since the paravane could give ships no protection against ground mines, they were provided with a simple but effective device known as a "degaussing girdle," which could be fitted to vessels of any size: a band of wire fastened round the hull, level with the upper deck and energized by an electric current, which has the effect of neutralising the ship's magnetism and giving her almost complete immunity. At one time 1,200 miles of wire cable were being used weekly to fit the ships.

It was this degaussing gear which made it possible to send R.M.S. Queen Elizabeth on her maiden voyage to New York, and it has saved countless other vessels, great and small, from destruction. It seems ironical that the unit of magnetic flux, which is one of the means of countering the magnetic mine, should derive its name from a German scientist, Carl Frederick Gauss (1777-1855). One Senior Officer of a minesweeping flotilla found it a name to conjure with when, after an abortive search for a magnetic minefield, he complained that he had been sent on a wild gauss chase.

Once these remedies had been found, the losses were far less disastrous. The sweepers,



A PARRY TO EVERY THRUST. Arrows point to the famous H.M.S. Vernon invention, the "degaussing girdle," around the liner Queen Elizabeth. This electrically energized belt neutralizes the ship's magnetism and gives her almost complete safety from magnetic mines.

however, were faced with a resourceful and remorseless enemy, who knew how to vary his tricks and was deterred by no considerations of chivalry in his designs for paralysing British commerce. Time after time he launched an intensive mining campaign, and at one period attacked defenceless fishing craft to prevent their being used as minesweepers. Occasionally a mine or float would be picked up inscribed with threatening messages. One, scrawled in white paint, read, in somewhat ungrammatical German rhyme:

"Geb ich ein gut Geleite Churchill hat dann grosse Pleite."

which may be translated:

"Guide me on my way aright
Then Churchill will be in sad plight."

It now reposes in H.M.S. Vernon's museum, alongside the most treasured "carcass" of all, the first magnetic mine.

The German occupation of Norway, Denmark, Holland, Belgium and France, and Italy's entry into the war, placed an even heavier burden on the sweepers. A new phase of mine-warfare began: the laying of

contact mines by E-boats after a preliminary aircraft attack on the sweepers. In these offensives the sweepers gave a good account of themselves, although there were inevitable casualties, including one trawler sunk with nineteen of her crew. But many aircraft were brought down. H.M.T. Berberis, who destroyed one and severely damaged another off the East Coast, received a signal of congratulation on her efficient gunnery from the Board of Admiralty, which also bestowed praise upon the whole Patrol Service in the Nore Command for its excellent spirit in the face of repeated air attacks. Nor was the campaign confined to the waters off the East Coast, for Dover, the Solent, the Bristol Channel, the Mersey and the Clyde were visited by minelaying aircraft. The Dover trawlers, besides being bombed and machinegunned from the air, were under frequent shell-fire from the French coast.

The Admiralty's answer to this campaign was sweeping by night. This was unknown in the last war and it presented a complex problem, particularly in the tidal channels of the Thames Estuary. But it was mastered, under the pioneer leadership of Captain G. B. Hartford, D.S.O., R.N., and during the winter of 1940 the sweepers of one base covered 1,000 miles every week. The strain on officers and ratings was severe, and the work was not done without loss, but the casualties were far less than they would have been in daylight operations, exposed to air atfack.

The result of the sweeping during the first twelve months of the war was an achievement of which the little ships could be proud, but for them there was no resting on their sweeps. From day to day there was no knowing what fresh "secret weapon" would confront them. None knew better than they that across the water the best brains in Germany were devising new engines of destruction, one of which at any moment they might have to meet.

In due course it came. Observers began to notice that minelaying aircraft would cut off

their engines before releasing their mines. There were reports of more unexplained explosions, some of them in water which had been swept for ground and contact mines. The new type was found to be actuated by the underwater sound emitted by the passage of ships through the water. This became known as the acoustic mine. Once again the experts of H.M.S. Vernon tackled the problem and took measures—which of necessity must remain secret—to counter the new campaign.

So the battle of brains goes on. It was certainly well for British shipping that the German claim to have sunk H.M.S. Vernon (in fact a shore-based establishment) was a Goebbels lie. While the Germans continue to produce their "ingenious variations," as Mr. Churchill has called them, the men of the Vernon continue to lay their counter-plans, deducing from their experience what the next trap may be, so that they may be ready when it comes and, if possible, at least one jump ahead in their precarious work of finding the right equipment to place in the hands of those whose duty it is to sweep the sea.

DEAD LETTER. The German message on the captured mine says: "Guide me on my way aright, then Churchill will be in sad plight."



THE TRAINING of the officers and ratings for the Minesweeping Branch of the Royal Naval Patrol Service is carried out at the naval establishment known as H.M.S. Lochinvar, based on the shore of a Scottish firth.

Every three weeks a score of officers arrive from H.M.S. King Alfred, where they have completed their cadet course; they have taken an additional gunnery course on trawler weapons in H.M.S. Excellent. All have served varying periods as ratings and have been commissioned as Sub-Lieutenants in the Royal Naval Volunteer Reserve. They have volunteered—or perhaps it would be more correct to say that they have expressed a preference for—the Minesweeping Service, of which some of them may have had experience on the lower deck.

At the beginning of the war trawlers were regarded (by those who did not man them) as the lowest form of marine life: all they could do was to "tow a bit of wire." The sweepers themselves have changed all that. Now that the Navy has seen what they can do, there is competition to join them. Some men prefer to serve in battleships and cruisers, but those who have shared the more intimate life aboard a sweeper believe their branch to be the finest in the Royal Navy.

The applicants are, however, specially selected, for the work makes peculiar demands upon a man besides those ordinary "officer-like qualities" which the Navy requires. A minesweeping officer must be a Jack of many trades and master of most. He must be technically-minded, to understand the intricacies of the modern sweeping-gear. He must have a bent for pilotage, for when in command of a sweeper he will be his own Navigator and must be familiar with the particular navigational problems of trawlers. He must be competent to keep his charts up to date, to plot the position of a minefield, and to read signals. He will also be his own Gunnery Officer, and requires a sound knowledge of the armament used in minesweepers. And besides all this he needs the endurance

5. THE NEW



of a strong body, the initiative of a quick mind, and the resolution of a gallant spirit.

The object of the six weeks' course in H.M.S. Lochinvar is to develop these qualities and to fit the "trainees," as they are called, to become officers of minesweeping vessels. At the beginning of the course the officers spend two days at sea in trawlers or

BROOMS





THE MEN OF THE SWEEPERS learn to be masters of their dangerous job in H.M.S. Lochinvar, a shore establishment. Left, rating trainees are taught wire splicing. Above, the mechanism of a mine is explained to officers, seen through the shrouds of a mine-dropping parachute; an officer studies pilotage and chartwork; another takes a compass bearing.

paddle-sweepers. These are special training ships, and their Commanding Officers and First Lieutenants are members of the instructional staff. Not more than half a dozen officers are sent to each ship, and as soon as the vessel is under way they go up on the bridge, where the Captain gives individual instruction in station-keeping and signal

recognition, allows each one to navigate the ship in turn, and gives him practice in dropping and picking up the dan-buoys which are used to mark the position of mines or the limits of a cleared area. During the day the officers have an opportunity to watch the sweeps being veered and hauled in.

Sometimes they are sent for instruction to

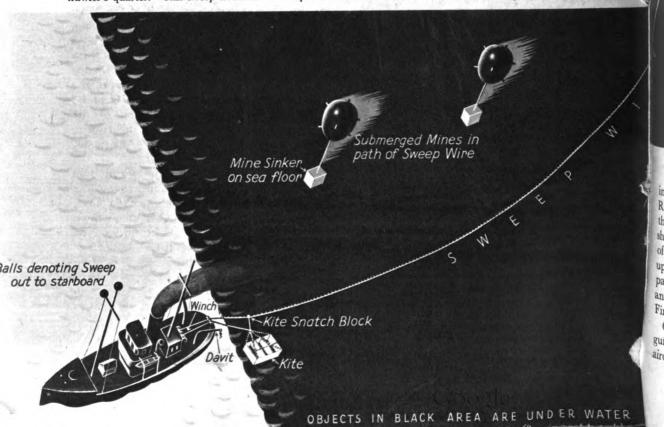
a newly-commissioned minesweeper which is "working up" in the firth. These exercises are also under the supervision of the Lochinvar instructional staff, their object being to accustom the Commanding Officer and Navigational and Watchkeeping Officers to shiphandling and station-keeping when using the various types of sweep, and to train the ship's company in the handling of sweeps and dans. Usually one week is devoted to minesweeping, one to gunnery practice, one to general drill, and the fourth to seamanship, so that the sweeper may join her Base with her officers and ratings confident of themselves and their ship.

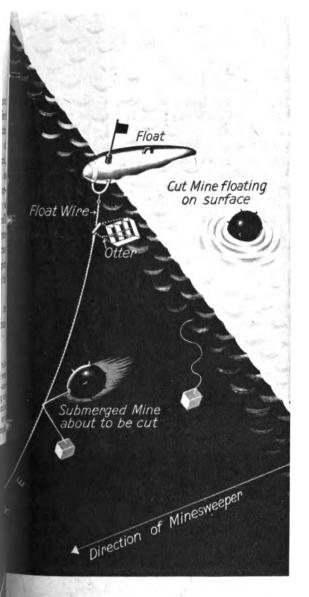
By visiting these vessels the officers under

instruction are able to obtain some experience of the practical side of minesweeping before studying the theory. The subjects of the lectures ashore include the mechanism of mines, the movements of tides, chart work, the technical side of minesweeping and its application, seamanship and pilotage, store-keeping and the internal administration of minesweeping vessels. The classes are small, so that teaching may be individual. Increasing attention is being paid to visual instruction by means of films. During this period the officers live in the hutment camp on the wooded hillside above the firth.

At the end of their training "on the beach" they go afloat for three weeks' train-

THE SWEEPER AND HER SWEEPING GEAR. It is the sweep wire curving back from the trawler to the otter that does the work. In the black part of the diagram, where everything you see is under water, the sweep wire cuts the mooring cables of the mines. They then bob to the surface, and are exploded by gunfire—unless the sweep wire has already exploded them. In the diagram one mine has been severed and the mooring cable of another is being cut. The otter and kite work on the principle of air kites; the kite holds the inboard end of the sweep wire down; the otter, suspended from the flagged torpedo-shaped float, takes the sweep out on the trawler's quarter. This sweep is called an Oropesa. Balls at the masthead show that sweeping is in progress.





ing in trawlers which are fitted with Gun Rooms to accommodate ten officers. There they form the non-specialist crews of the ships, veering the sweeps and doing the work of the men whom they will later be called upon to command. Much attention is also paid to gunnery, watchkeeping and pilotage, and each officer takes his turn of duty as First Lieutenant.

On "Action Stations" they will range the guns on an imaginary submarine or hostile aircraft. Masked figures will race along the

decks when the gas alarm is given, on fire duty or putting out collision mats. The commands "Man Overboard" and "Away Seaboats" demand the appropriate drill. Sweeps are veered in various formations. Dan-buoys are laid and recovered, sights taken, the fog-buoy streamed, the anchor weighed by hand.

Thus are bodies and minds trained to be vigilant and alert, and all learn to work in a team. For this is the chief lesson which minesweeping training has to teach: efficiency is achieved not only by the Captain and the First Lieutenant knowing their job, but by the whole ship's company working together with the precision of a rowing eight and the cooperation of a rugger fifteen.

Having completed the course, the officers sit for a written examination. Those who pass (and few fail) go to the Minesweeping Officers' Pool to await posting to ships.

In addition to the course for newly-commissioned Sub-Lieutenants, a number of officers from different branches of the Navy come for a week's training in minesweeping, either as a refresher course, if they have been in the Minesweeping Branch and left it for a time, or for concentrated instruction if they are new to the work. Many officers of the Royal Naval Volunteer Reserves of Canada, Australia and New Zealand, and of the Royal Indian Navy, have taken this course, also those of the Allied Navies—Americans, Dutch, Belgians and Norwegians.

No less important than the training of officers is the training of ratings, of whom 50 arrive every week for a three weeks' course. To-day these are all "H,O." men—those who have joined the Navy for hostilities only. After receiving their general training in one of the establishments ashore they have been drafted to the Patrol Service in accordance with naval requirements, and, having been fitted up at their Headquarters, those who are destined for minesweeping are sent to H.M.S. Lochinvar for special training.

Like the officers, they spend two days at



"OUT SWEEP." Above, the float with its flag is ready on its chocks. The otter is being lowered from the davit. Right top, launching the heavy Oropesa float needs both strength and care, especially in rough weather. The careless, if there are any, may crush their hands between float and vessel. Everyone lends a hand except the stokers below. Right bottom, down the float goes. Soon it will be bounding along 500 yards astern and 250 yards out on the quarter.

sea and acquire practical experience in the manual working of the sweeps, in splicing the wire hawsers, in steering the trawler, and in those deck duties which the Navy describes by the expressive term "pulley-hauley." Ashore, Petty Officers give them instruction in trawler gunnery, rifle practice, deck work and general seamanship, so that they may take their places as efficient members of any minesweeping ship, whether she be trawler, drifter, dan-layer, or fleet sweeper.

At the end of the course the majority return to their Headquarters to await drafting, but a certain number go to the ships of one of the training flotillas in the firth, where they too form the non-specialist members of the crews for a further three weeks. This practical instruction has proved immensely valuable and is being extended as more vessels become available.

In this way nearly 2,000 officers and over 10,000 ratings have been trained in H.M.S.





Lochinvar since the outbreak of war. Among them have been 500 Skippers, R.N.R., but to-day the newly-commissioned officers all belong to the R.N.V.R. No officer who has passed the Lochinvar course has been found incapable of doing the duty required of him, and none has ever applied for transfer to another branch before sitting for his examination.

One of the most remarkable aspects of the naval side of the war is the increasingly important part the R.N.V.R. officers are playing in all branches of the Service. In the last war there were very few in the minesweepers and there was a tendency throughout the Navy to regard them as amateurs. To-day the fine work they are doing is appreciated by their brother officers of both the Royal Navy and the Royal Naval Reserve, and nowhere is it more valuable than in the minesweepers, the majority of which are now commanded by officers of the R.N.V.R., who have thus become entitled to regard themselves as much an integral part of the Fleet as officers who specialize in submarines or naval aircraft.

All the more credit is due to these young officers because, before they joined the Navy, the majority were landsmen who knew nothing of the sea and they have had to earn the respect of their men. On a single course in H.M.S. Lochinvar recently, the R.N.V.R. officers under instruction included those who in civilian life had been a Local Government clerk, a surveyor's assistant, a chemist, a shop manager, a schoolmaster, a chartered accountant, a printer, a bank cashier, a glove manufacturer, a cine-technician, a salesman in the woollen trade, an inspector of the Metropolitan Police, a fur-buyer, a display artist, a fiction writer, an architect, a cabinetmaker and an Australian sheep-farmer.

There is a Negro proverb "New broom sweep clean, but de old broom know de corner." The new brooms of the R.N.V.R. and the old brooms of the R.N.R. are proving a formidable sweeping combination for the German minelayers.

SWEEPIN 6. THE CHANNEL THE MAJORITY of the officers and ratings who pass through H.M.S. Lochinvar are posted to trawlers, which in this war, as in the last, are the mainstay of the Minesweeping Service. These seaworthy little steel ships, with high bows, a length of about 140 feet and a displacement of between 200 and 300 tons, may be seen in scores at any of the minesweeping ports of Great Britain, lying three or four abreast alongside the quay, steaming out to their sweeping grounds, or returning to port after their spell at sea.

To-day they are painted grey and carry numbers, but when in harbour they display their names in white letters on a black board. These names are sometimes high-sounding, such as Earl Kitchener, Lady Philomena, Three Kings; sometimes poetic, such as Sweet Promise, Sea Holly, Waveflower. Some, like Stella Leonis and Stella Rigel, are the names of constellations; some of jewels—Sapphire and Emerald, of trees—Acacia and Olive; of the Knights of the Round Table—Sir Gareth and Sir Lancelot; or of more mundane gentlemen, such as William Stephens.

Many of them have their own badges, perhaps designed by the Skipper, executed in colour by one of the hands and proudly displayed on the "verandah" which encircles the wheelhouse below the upper bridge. One has a representation of the Old Man of the Sea and a brush; another a brush, a mine and a flash of lightning (symbol of the magnetic sweep) with the motto Mare clausum veni, which the Skipper will translate for the benefit of new hands as "The sea was closed to commerce before I came." The Stella Rigel has a mine below her starry cluster and the motto (disdaining Latin), "To hell with Hitler."

The trawler's usual armament is a 12-pounder on the whaleback in the fo'c'sle head, an Oerlikon (or twin '5's) on the gun-platform aft, two Lewis guns on the "verandah" and a Holman projector, which fires shrapnel bombs for short range use against aircraft.

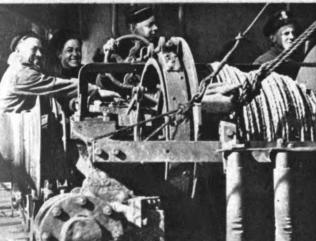
The normal complement of the minesweeping trawler is 23; the Skipper and the Second Skipper, who acts as First Lieutenant; the Second Hand, a Chief Petty Officer; two Enginemen, both Petty Officers; a signalman ("Bunts"), a telegraphist ("Sparks"), a gunlayer, a wireman ("Torps"); a motorman, eight seamen, three stokers, a cook, and an assistant steward.

Every man has his own sweeping station, each seaman his own place at a gun. If the look-out sights an enemy aircraft, surface vessel or submarine, "Action Stations" is sounded by an alarm bell. The Skipper remains on the upper bridge. The Second Skipper is in charge of the 12-pounder. The Second Hand takes the wheel from the helmsman, who closes up to his gun position. One stoker remains below with the engineers. The others serve the 12-pounder ammunition from the magazine and stand by to put out fires on deck. The cook helps to serve the gunlayer, while the wireman fills the pans of the Lewis guns.

When a trawler has brought down an enemy aircraft she is entitled (by the custom of the Service) to paint a swastika on her funnel, while the tally of mines destroyed is kept by chevrons and stars; a white chevron denotes a single mine, a red chevron five, a blue star twenty-five, and a red star fifty. The record is held by H.M.T. Rolls Royce, which to date has a total of over 150 mines to her credit.

The ratings berth for ard, every man with his own bunk—there are no hammocks. The Skipper's cabin is amidships, below the Chart Room, and there is a tiny Ward Room. All aboard earn their "hard-lying money"—a shilling a day for ratings—although the accommodation is considerably more comfortable than it was in peace time. The food is good and well cooked. The favourite recreations on board are draughts, dominoes, solo and cribbage. There is always a ship's cat, and often a dog as well. In one trawler a budgerigar flies about the mess-deck: another







THE TEAM. Top, running up signal flags. Centre, manning the winch which winds the sweep wire in and out. Bottom, down below at the engine-room throttle.

has as her mascot a large duck, which waddles pompously along the deck, swearing at the seagulls.

In peace time a trawler skipper is usually a man of substance. Some, particularly those who work in Arctic waters, earn £2,000 a year and more. Most of them have been at sea since they were sixteen, and have been in and out of ships all their lives. They have to spend four years on deck and one year as mate before they can sit for a skipper's ticket, which entitles them to take any ship into any waters, provided she is going fishing. The sea experience they gather with the years enables them-to navigate by instinct rather than by chart.

The skippers are independent by nature and conservative by tradition. When fishing they have their own methods of enforcing orders, much as the father of a large family has his; indeed, they are often related by birth or marriage to many of the crew and usually call them by their Christian names. All fishermen have an intensely developed civic pride and there is usually a friendly rivalry between a Grimsby trawler and one from Hull or Aberdeen. They are also extremely superstitious. The words pig and rabbit may not be mentioned aboard a trawler; and it is considered bad luck to go out of harbour astern, to put a hatch on upside down, or lay a broom across a trawl.

On the outbreak of war, when many of the trawlers were taken over as minesweepers, the skippers were placed in command, with fishermen as ratings. Some of the skippers had been trained in the Royal Naval Reserve, a certain number had served in the last war, others joined the Navy for the first time. They were given the rank of Skipper-Lieutenant or Skipper, R.N.R. Most of them were splendid seamen, but they did not take easily to filling in forms or writing official reports; they were often puzzled by the Confidential Books issued to them, and one was bewildered by a signal in which the word "rendezvous" occurred. They had but a

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hazy idea of naval discipline, and preferred their own way of handling their men.

On the morning war was declared the Commander M.S. of an East Coast port was on board one of the trawlers which had just been commissioned. He pointed out that the Skipper's duty was to read the Articles of War. The Skipper fished out the Articles from a drawer beneath his bunk, looked dubiously at their many clauses, then told the Second Hand to turn all hands up on deck. When they had assembled, he addressed them thus:

"Now lads, we've just heard over the wireless that England has declared war on Germany. I'm supposed to read you the Articles of War. There's a lot of 'em and most of you wouldn't understand nothing if I did read 'em. But what they really mean is this: now we're at war, this ship's yer home. Minesweeping's hard work, and fairly dangerous. I was blowed up twice last time, but I'm all right. You do yer duty and when you gets into harbour you has certain privileges. If you does yer work properly me and the Commander" (with a jerk of his thumb over his shoulder to indicate that officer) "will see as how you gets those privileges. That's all."

That was language the fishermen crew understood. But the Minesweeping Service expanded fast. As in the last war, it could not be manned by fishermen alone and there were more trawlers than skippers. organisation developed, two trawlers formed a unit, with a Skipper-Lieutenant, or a Lieutenant, R.N.V.R., in command, and two units made up a group, usually under a Lieutenant, R.N.R., or a Lieutenant-Commander R.N.V.R. It was inevitable that the skippers should regard these officers, who were often much younger than themselves, with some suspicion. At first they tended to keep themselves apart, and in the local hostelries ashore they would collect in groups of their own, while the R.N.V.R. officers formed theirs. But thanks to the tact of the younger officers and the readiness of the skippers to recognise efficiency when they saw it, gradually mutual confidence was born of experience and all came to work—and drink—together.

So it was with the H.O. ratings who were drafted to the trawlers. They were new to the sea and ignorant of the traditions which the fishermen held dear. There were times when, like a traveller visiting an unknown native tribe, they stumbled against a tabu and unwittingly gave serious offence. On one occasion a wireless telegraphist, not long transplanted from civil life, brought back to his ship a brace of rabbits under the impression that all on board would appreciate a change of diet. The trawler was the senior ship of the group, commanded by a Lieutenant, R.N.R., who heard a sudden commotion in the fo'c'sle. He summoned the Second Hand, who informed him that the men were protesting against sailing with the rabbits on board. The Group Officer was a man of experience and wisdom. He issued no orders. He merely called up "Sparks". and persuaded him to drop the rabbits overboard. That done, peace was restored.

As long ago as 1663, Sir Roger L'Estrange called the English fishery "the only common nursery of seamen," and the Navy is not likely to forget the fine men, both skippers and ratings, which the Fishing Fleet has given it in time of war. To-day, however, it is rare to find more than a couple of fishermen in a trawler and the ratings come from many trades—from butchers to bus-drivers, from metal-workers to market-gardeners. Men who work on the soil always take readily to the sea, but even a ladies' hat renovator is not unknown in a trawler. One cook's civil occupation was that of an asphalt-mixer. His rice-puddings were said to run true to trade.

It was not long before the skippers came to recognise the worth of these young men. Landsmen they might be, and lubberly at first, but they had joined the Navy to fight for their country and they were anxious to



THE BOMBER 8WOOPS. In the tiny-looking British trawler, men are rushing to the guns. The German bomber takes their picture as it races down upon them.

learn. Once they had shaken down they showed intelligence and initiative.

"You can take the average Englishman afloat and make a seaman of him in three months, once he gets over his seasickness," is the opinion of one trawler skipper. "Go far enough back and you'll find there was a seaman in his family. The biggest trouble is to make them keep their lifebelts on, or to make them realise there's any danger—until a mine goes up alongside."

After six months at sea a rating earns the right to wear a badge of the Royal Naval Patrol Service: a shark with a marlin-spike to represent the anti-submarine vessels, and a mine for the sweepers.

At first neither the skippers nor the fisherman ratings took kindly to naval routine, but they have come to take a pride in keeping their ships clean and in turning out in smart naval rig when they go ashore, while at Divisions on Sunday mornings the sweeper crews in port will vie with each other on the quayside, and march past the Commander M.S. (to the music of a gramophone relayed by loud-speaker) with a swing that would not disgrace the men of a battleship.

The ratings are well looked after at each Base. There are ENSA concerts, cinemas, a well-stocked canteen, a comforts store and

shower-baths. Football and cricket matches are played between ships and groups, with a cup given by the Captain of the Base, and when a trawler is de for her three-monthly boiler-cleaning one watch has five days' leave. Boiler-cleaning is a mysterious word to many relatives of men in the Minesweeping Service. One lady defined it as "the time my old man comes home."

At every port there are always a number of trawlers with steam up at instant readiness



for sea; the remainder proceed at their appointed time, and thus they keep the 1,700 miles of War Channel clear for shipping, sweeping day and night. Only exceptionally hard weather will confine them to port, and then only because they cannot sweep efficiently in a high sea. Their losses have been considerable, both from mines and aircraft attack, but the skippers and their crews remain imperturbable.

The presence of R.A.F. fighter protection gives a sense of security and is much appreciated, but the trawlers have to accept the risk of sweeping alone and then rely upon their own armament. They have accounted for many enemy aircraft, and one skipper, who has several to his credit, was once asked to explain his technique to ratings under gunnery instruction. His lecture was as follows:

"I sees an enemy aircraft ahead. It gets a bit closer, so I calls my mate Bill and says, Enemy aircraft on the port bow, Bill. Get on the gun.' So Bill gets on the gun. Then I says, 'Shoot the beggar down, Bill.' And Bill shoots 'un down."

On another occasion two trawlers, the Syringa (Skipper W. T. Ritchic, R.N.R.) and

the Reboundo (Skipper H. A. Catchpole, R.N.R.), were sweeping in company in the Channel, when they sighted an aircraft, which appeared to be a Junkers 87, approaching from the south-eastward and flying at about 300 feet. The Reboundo challenged, was answered by a burst of machine-gun fire, and then opened with her 12-pounder and Lewis gun. The aircraft crossed the trawler's quarter and dropped a salvo of five bombs on either side.

It then attacked the Syringa, whose armament also went into action, spraying the bridge and deck with machine-gun bullets, and dropped two more salvoes, one missing to starboard, the other to port. Turning away to starboard it again bombed the Reboundo without damaging her, but a machine-gun bullet wounded Skipper Catchpole in the thigh.

Then came the Syringa's turn again. Seaman-Gunner Colyer, at the Lewis gun, was killed by a burst from the German reargunner as the aircraft passed over the trawler, and a bomb pierced the engine-room casing. It landed on the platform on the fore side of the engine, but failed to explode.

The aircraft then returned for a third

attack, this time on the Syringa only. As it approached, it appeared to be losing height until eventually it came within range of the Syringa's low-angle gun, which opened fire. After the second round the German crashed into the sea a mile from the ship.

Skipper Ritchie then went down to the engine-room, where Stoker Petty Officer G. H. Wood, R.N., had remained at his post throughout the engagement.

"With the assistance of Chief Engineman E. C, Clinton," wrote the Skipper in his official report, "I carried the bomb on deck and threw it overboard."

The Navy is accustomed to understatement, and Skipper Ritchie's succinct account of how he disposed of the unexploded bomb as though it had been a dead rat did not blind the Board of Admiralty to his courage, or to the Stoker Petty Officer's calm bravery in remaining at his post with the bomb lying at his feet. Skipper Ritchie was awarded the D.S.C., Clinton and Wood the D.S.M. Intensified mining by aircraft and E-boats stretched the minesweeping resources to the limit and involved heavy additional sweeping. With the aim of causing the utmost danger and destruction to merchant shipping the enemy was accustomed to choose as his objective a river estuary or the approaches to a busy port. Sometimes these minelaying offensives would continue at intervals for several weeks. At such times the trawlers might sweep continuously for 48 hours, covering 250 miles.

One such attack came when a strong force of enemy aircraft dropped an exceptional number of mines in port approaches on the East Coast. All the trawlers in the roads opened fire, but without appreciable results, since their armament is designed mainly for defence against dive-bombing.

The port was closed that night, but next morning the sweepers were under way at the first sign of dawn, and hopes were high for a record bag. Results were soon forth-



GOODBYE to the old mine, on to the new.

coming. Half an hour before sunrise H. M. T. Fitzgerald detonated the first mine, and so began a momentous day. Until eleven o'clock there was one explosion after another. In a single half hour no less than nine mines were destroyed, and twenty had gone up before lunch-time.

"Then came a lull, perhaps welcome to everyone," wrote the officer in charge of the operations. "Even the mines themselves seemed to be taking a long dinnerhour, nevertheless the sweepers toiled on, and by this time the full force were on the job. At 14.52 the sweepers seemed to get their second wind, and the buildings ashore once again felt the shock of mine detonations. This brought the grand total up to twentyseven mines for the day, which smashed all previous records. Sweeping continued up to dark, and then only were the sweepers satisfied with their day's work. One trawler was seen trailing forlornly into harbour about 21.00 hours, having toiled all day and caught nothing, but she knew that her job of work had been just as useful as that of the Cayrian, who could boast twelve mines in the day. Even then, the day's bag was not complete. One mine, apparently overcome with depression at the fate of his fellows, threw in the sponge and detonated of his own accord."

Day after day the clearance went on, the sweepers once beating their own record. The men felt that they were masters of the mines and the general attitude was, in the words of the official report, "Let 'em all come! We can deal with the mines faster than they can lay them, and we can keep it up longer."

The account of the last day's operations is best described by a quotation from the same report:

"The pack moved off soon after nine o'clock, led by the veteran Cayrian, closely followed by Strathborve and Gwenllian. If sport was to be shown, these were the ones to show it. The first covert was drawn blank, and the pack moved on to the next. Cayrian could do no good: it was not her day. Nose

to the ground, she searched the covert from end to end without success. It was nearly one o'clock and still a blank day. Then Strathborve gave tongue and the hunt was on. For the next two and a half hours the pace was killing, but the sweepers plodded on until the area was combed. Thus ended what must have been another record day,"

When the clearance was complete the close of play score, as the Commander M. S. puts it, varying his metaphor, was well over a century for no wickets. Not a single sweeper had been damaged and the one casualty to shipping was a fishing trawler. Only a part of her bow was visible when the spray subsided five seconds after the explosion, and nothing was picked up but a man's cap.

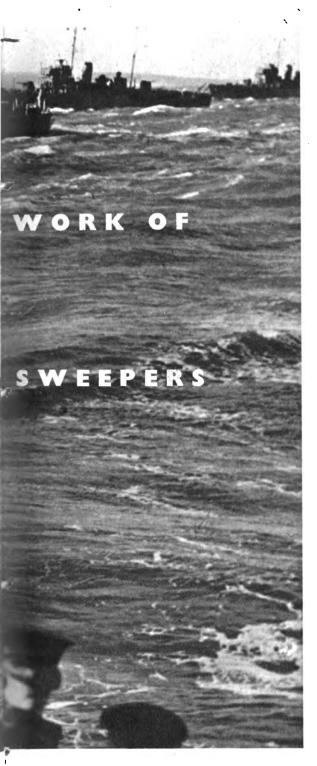
As against this loss many merchant ships and fishing craft had entered the port and sailed while the clearance had been in progress, swept in or out by the trawlers. The fate of the fishing vessel suggests the destruction that might have been caused to shipping had the sweepers not been there to do their work, which is but a single instance of their devotion to duty since the war began.

The destroyer has often been called the maid-of-all-work of the Navy; the mine-sweepers might be called the charwomen of the sea. In every town and city these hard-working women are up with the dawn, sweeping and clearing passage and office before their betters are abroad. Most people take their work for granted. Few know how they live; few even see them, save perhaps for a glimpse of one adjusting her bonnet as she departs. They are sturdy, weatherbeaten and good-humoured. Rain, hail or snow finds them at their task; and when there is a blitz they take it with a jest.

Like them, the minesweepers are as undeterred by blizzards as by bombs, and they have a spirit and a tradition of their own. They are seen by few outside their own calling, for by the time the big ships are due their sweeping is done, their gear packed, and they are under steam for home.

DANGEROUS AREAS: THE THE FLEET

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Desides the translers, a number of other vessels are employed on the routine sweeping of the War Channel: the motor minesweepers, which have a displacement of about 200 tons, used mainly to sweep ground mines in the shallow waters of river estuaries and port approaches; the whalers, many of which burn oil fuel, a matter of importance when a small crew is required to steam the ship on a long passage; and the drifters, which in peace-time fish for herring with drift nets, their size making them handy ships for sweeping in confined areas.

These vessels are not usually employed in clearing extensive minefields laid outside narrow waters, a duty which is the function

of the fleet minesweepers.

In the earlier days of the war the auxiliary paddle-sweepers were used for clearances. In fair weather a well-trained flotilla would carry out this work satisfactorily, but the paddlers' radius of action was limited, the risk of damage to their paddle-wheels made them particularly vulnerable, and when mined they were difficult to keep afloat, so that as more fleet sweepers came into commission they were relegated to other, but no less useful, duties.

The fleet sweepers do not belong to the Royal Naval Patrol Service, but are R.N. or "General Service" ships, and are classed as "major war-vessels." The oldest type is the Albury class, laid down towards the end of the last war, and named after inland towns in Great Britain—Pangbourne, Derby, Ross. They have a displacement of 710 tons, a speed of 16 knots, and are the only coalburners left in the Royal Navy: hence their nickname of "Smoky Joes."

Next come the Halcyons, named after minesweepers of 1914, somewhat larger and faster than the Alburys, while the new Algerine class is the largest and fastest of all. Between the two are the modern Bangors, called after British ports, which have been encouraged to adopt the ships of their own name, send them comforts and books, and



IT IS A TRICKY SWEEP. The enemy has laid a minefield overnight. Chart and rule before him, dividers in hand, the Senior Officer (contre) plans the clearance with the commanding officers of his flotilla.

raise money on their behalf in Warship Weeks.

The larger and faster of these minesweepers operate with the Fleet. Their speed enables them to sweep ahead of the capital ships when necessary, and their size fits them to carry an increased offensive armament of guns and depth-charges, so that when not minesweeping they can undertake escort and anti-submarine duties, particularly when the Fleet is covering the passage of an important convoy.

One of them recently rammed and destroved a German submarine in Arctic waters, and when H.M.S. Edinburgh was torpedoed three of the Halcyons put up a spirited fight against superior forces. The Flag Officer in command had given orders that they should retire at full speed under a smoke screen if attacked by surface-craft. These orders never reached them. When the Edinburgh was hit, instead of turning away they turned towards the enemy destroyers, "going in like three young terriers," as the Admiral said, and firing whenever visibility permitted. Then, while one made a smoke screen, the other two went alongside the sinking cruiser and took off the whole ship's company. The Admiral was among the last to leave. As he stepped on to the sweeper's quarterdeck her Commanding Officer saluted.

"Everything correct, sir. Your flag is hoisted."

The Admiral looked upwards. Flying at the masthead was the Cross of St. George, with two red balls in the upper and lower cantons. Its ragged edge suggested that it was a Senior Officer's pendant from which the tails had been cut, and the red balls looked as though they had been hastily daubed on with red paint. But there was no mistaking it for anything but a Rear-Admiral's flag.

It was a gesture which no German could hope to understand: but one that Nelson himself would have appreciated.

The smaller fleet sweepers do not normally accompany the Fleet to sea or perform escort work, but nevertheless must have a speed which enables them to tow their sweeping outfit through the water faster than the trawlers, and sufficient fuel endurance to remain at sea during protracted clearance operations. They must be good seaboats, handy, with a low silhouette, equipped to hunt and sink submarines, with ample closerange weapons against aircraft, since when sweeping their restricted freedom to manceuvre makes them an attractive target for the dive-bomber.

The Bangors fulfil all these conditions. They run as smoothly as a sewing-machine, and although lively movers in rough weather, they go with the sea rather than argue it and their buoyancy saves them from shipping green water. They cost about £150,000 each, have a displacement of about 700 tons, and their main armament is a three-inch gun forward and a pom-pom aft.

The bridge is covered and the helmsman has a steel protection round the wheel. The Commanding Officer's quarters are immediately below the bridge, the Ward Room aft, with the officers' cabin-flat below. There are

eight messes, but when the ship is sweeping only the special minesweeping mess-decks aft are used, the others being closed and made watertight.

The Bangors carry a total complement of about 80, including five or six officers. The First Lieutenant is responsible to the Commanding Officer for all the minesweeping gear on board. There is one Gunnery Officer to each flotilla; one, or sometimes two, Surgeons, with a sick-berth attendant in the Senior Officer's and Doctor's ships.

The principal Chief Petty Officer is the Bo'sun's Mate (known as the Buffer), who, under the First Lieutenant, supervises the hands engaged in sweeping operations. The Coxswain is the senior helmsman and the ship's housekeeper. The Chief Stoker is in charge of the engine-room ratings under the Commissioned Engineer and supervises the big winch on the quarterdeck when the ship is sweeping. About fifty per cent of the ship's company are "Active Service," or R.N. ratings, the remainder "Hostilities Only." There are about 36 deck hands, the others being signalmen, engine-room and technical ratings, cooks and stewards. When the sweeps are out every man not on watch is at his action station or on fook-out, except the engine-room ratings and the two cooks.

Like the trawler hands, the men in the fleet sweepers are well cared for. Each ship has her own NAAFI canteen, and clothing may be bought (without coupons) at the Base "Slop Shop."

During sweeping operations the Bangors usually anchor for the night, and, as in the trawlers, one watch goes on leave when boiler-cleaning comes round, so that each man has five or six days' leave about every six months, and three weeks' during the annual refit. When in port the ratings have shore liberty; entertainments are arranged and there are plenty of opportunities for sport. On board the favourite recreations are ludo, darts and tombola, the only form of lottery recognised in the Navy. Each ship

has a library, kept by the sick-berth attendant or a Petty Officer.

Since a flotilla is seldom at sea for more than four days at a time there is always plenty of fresh food on board. Each mess appoints its own caterer. The Coxswain issues meat, potatoes and fresh vegetables daily; tea, sugar and tinned milk twice a week. As in all naval ships, every man is entitled to a tot

BETWEE'N SWEEPS. The crew of a minesweeper relax on one of the mess decks of H.M.S. Rothesay. Fleet sweepers carry about eighty men.



of rum daily at 11.30, or an allowance of threepence in lieu.

Two men from each mess are detailed every day to prepare the food, which they deliver to the gook in the galley. When the ship is sweeping, the men feed as opportunity offers, but an electric heater ensures a hot meal at any hour.

The officers have much the same food as the men, cooked in the same galley. Their Ward Room is small but comfortable, usually equipped with a dart-board and a wireless set, which is seldom silent. A fleet sweeper does not mark her score of mines on the funnel, but it is often to be seen in neat black letters on the white paint of the Ward Room bulkhead.

Sometimes the Ward Room rations are supplemented by a parcel, particularly when there is a Sub-Lieutenant from one of the Dominions on board. They are good parcels, put together by people of imagination, and the senders would be gratified if they could be there to see the reception they receive.

There is much friendliness between the officers of the flotilla. When in harbour the ships lie abreast in pairs, so that the Ward Room of the one nearest the quay forms a natural port of call. Nearly everyone has a hobby to which he can devote any spare time he may have on board. Making ship-models

is popular, and some enthusiasts have revived the old craft of inserting them in bottles, as fine a test of patience as any devised by man. In one ship the First Lieutenant, who left the Stock Exchange for the sea, has imbued the members of his Ward Room with a passionate but academic interest in the movements of stocks and shares, and one Senior Officer amuses himself with the compilation of "Famous Last Words" as applied to minesweepers, from which may be quoted "No mines there, we swept there yesterday "--"They won't bother us, we're too small" -" He won't have any bombs, he's going home "-and "It's only the engine-room fans."

There are eight ships in a flotilla of fleet sweepers, under the Senior Officer, who may be either a Commander R.N. or R.N.R., and a Commander as Second Senior Officer. Each flotilla works directly under the orders of the Commander-in-Chief of the Command in which it is required to operate. Its main function is to clear an area which has been declared dangerous.

The successful clearance of a minefield is the result of careful planning, meticulous training and rigid discipline. Lessons learnt in the last war must be studied, later technical developments efficiently applied. With perhaps as many as a dozen ships working



together, it demands navigation and seamanship of a high order. A faultless clearance does not appear spectacular, but is the result of the skill and leadership of the Senior Officer, combined with the team-work of every officer and rating in the flotilla.

Such an operation may be described to show the work which the Bangor sweepers are called upon to do. One morning, when the flotilla is in port, signals begin coming in to the Base showing that there is trouble in the War Channel. Two merchant ships in a south-bound convoy have been sunk, and one of the escorts damaged. It becomes clear that E-boats have laid a minefield during the night. The trawlers are on the spot and have swept the area for ground mines with negative results. As yet it is impossible to define the limits of the minefield, and the Commander-in-Chief directs the flotilla of fleet sweepers to make a hundred per cent clearance. Meanwhile the convoys which are in transit or about to sail are held back.

The Senior Officer of the flotilla, having been given his orders and told the approximate position of the dangerous area, is left to make his own dispositions. He summons his commanding officers to a conference in his cabin or in the Ward Room of his ship. With a chart spread before him on the table and a pair of dividers in his hand he tells them what has to be done and how he proposes to do it. The operation is regarded as "tricky," and every precaution is taken against risking the ships unnecessarily. Each captain is given his orders, certain ships being detailed to act as dan-layers, others to follow the sweepers for mine-disposal.

The commanding officers return to their ships and in their turn call their officers together. The First Lieutenant is told the general plan so that he may know what sweeps to have ready. The Navigator is shown the position of the area to be cleared. The Commissioned Engineer is warned to have steam at the time appointed for sailing.

Before the flotilla puts to sea, the First Lieutenant gives orders for the watertight doors on the mess decks to be closed. This tells the ratings that they are going into a dangerous area. There is a hum of expectancy and everyone is on his toes.

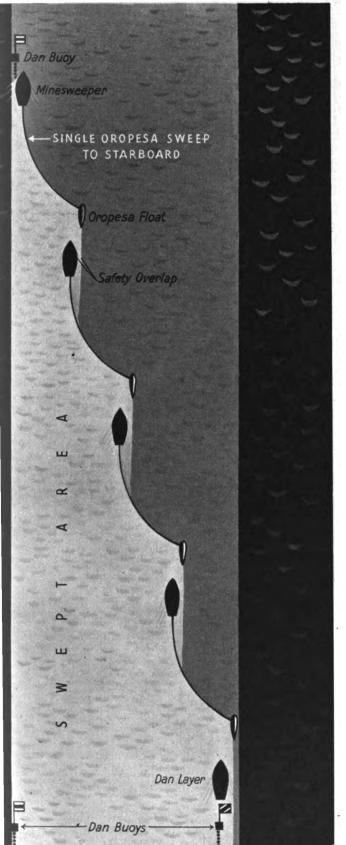
As each ship leaves port she "embarks" a balloon. The flotilla is a brave sight as it steams out from the coast on its mission, keeping accurate line and station. The Senior Officer has arranged the hour of sailing so that the flotilla may begin sweeping with the benefit of the extra depth at high water. When it reaches the area, the limits of which have been marked by dan-buoys, the sea is still covered with wreckage from the ships that have been lately sunk—rafts, waterlogged lifeboats, spars, hatch-covers, packing-cases, and tables floating with their legs upturned to the sky.

If the Senior Officer were making a search, he might take his ships over the area in line abreast with both port and starboard sweeps out, but since he has to sweep water which has already been declared dangerous he adopts an echelon formation, whereby only the leading ship—his own—is in unswept water during the initial lap. One of the danners—a millionaire's yacht in peace-time—follows the outside ships to buoy the limits of the area swept. These dans are steel canisters attached to long flagged poles, with strings of elliptical pellets to show the direction of the tide. A third vessel will weigh the dans when they are no longer required.

The flotilla approaches the dangerous water in formation. There is a signal hoist from the senior ship. In each sweeper a quartermaster pipes the order "Hands to sweeping stations." The First Lieutenant takes charge of the quarterdeck, the Buffer superintending the sweeping party, the Chief Stoker the winch.

The dangerous area is some eight miles in length and six in breadth. When the sweepers have completed the first lap—one length—they haul in their port sweeps, turn on to

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the second lap, the senior ship following the line of dans, put out their starboard sweeps, and begin again.

On the first two laps the sweeps draw blank; the Senior Officer has been cautiously edging on to the dangerous water. But the first mine is cut soon after the ships have started on the third lap. It floats up to the surface, shiny black with protruding horns, half above, half below the water. A signal goes up, "Mine to starboard." All hands off duty come up to watch.

A cut mine is a free target for all, and a difficult one in a rough sea; when hit it will either explode or will sink as the water washes through the holes drilled by the bullets. The rifles of a destructor ship astern open fire, but the captain treats the mine with respect. He does not close to under 200 yards, and every man on deck wears his steel helmet. Suddenly there is a thud against the ship's side. A snowy mound of water rises from the surface of the sea, shaking the ship's gear. The mound swells into a mountain, then breaks into great columns of water and flying spray, high above the mastheads of the ships, as the crash of the explosion comes. If the ship is in luck she will have time to gather a haul of fish.

Mines soon begin to go up at frequent intervals, until the sea resembles what the Senior Officer calls "a veritable sago pudding of mines," but there is no damage. One sweep hauls in a waterlogged lifeboat. On the fourth lap the look-out of one ship reports that the float is no longer "watching"; it has suddenly disappeared. There is no knowing what may have happened. There

SWEEP IN PROGRESS. When an area known to be mined is swept, the sweepers adopt an echelon formation, so that only the leading ship, that of the Senior Officer, enters unswept water. The others follow, each leaving a safety overlap, so that the ship herself is in water already swept by the ship ahead. Last of all comes the "danner," laying buoys to mark the area. When one length has been completed, the flotilla turns and repeats the sweep in the opposite direction, the process continuing until the whole area has been cleared.



may be a mine caught in the sweep, or only a piece of wreck. The First Lieutenant orders the winchman to haul in. The wire comes in bright and burnished, proof that it has been running along the bottom.

"Clear the quarterdeck!" commands the First Lieutenant.

The sweeping hands retire (but not far), leaving the First Lieutenant and the Buffer at the stern, peering intently for a sign of any object caught in the sweep or the otter as the winch hauls slowly in. Most of the ship's company line the starboard guard-rail, watching.

"It's wonderful what them wires'll tell you," says one, with his eyes on the sweep. "They'll generally start singing if there's a mine there. But you can't be sure till you've hove in."

Next moment the float reappears, bobbing and plunging through the water like a hooked shark, the staff of the green flag cutting a veil of spray on either side. It is drawn closer and closer to the ship's quarter, but it is impossible to see the wire itself; the danger is that the mine—if mine there be—will be hauled out of the water under the counter before anyone can see that it is there.

When the float is about 30 yards from the stern it leaps out of the water and the otter rises for a moment above the surface, clear of whatever obstruction that caused it to sink. The ratings return to the quarterdeck to get the sweeping-gear in. By the time the fourth lap has been swept dusk is falling. Half the area has been cleared. The flotilla anchors inshore for security and continues operations at daybreak next morning, sweeping till dark with satisfactory results. The last lap is covered, the dans weighed. The Senior Officer's signal "In Sweeps" is hailed with relief, for it has been a long day for every man in the flotilla.

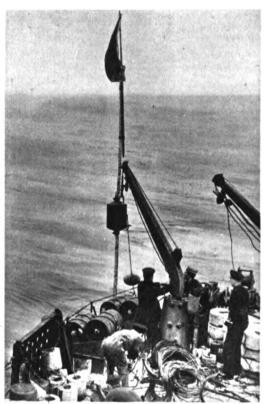
The Senior Officer makes a laconic signal to the Base: "Area cleared." The Bangors steam back to port at full speed in line ahead, taking flurries of spray over their bows. As they go, they see far away on the horizon two great convoys—one from the northward, the other from the south—approaching the water they have lately cleared. Not an hour has been wasted in speeding the trade on its way once it is safe to pass.

When the flotilla reaches port the Senior Officer receives a signal from the Flag Officer in command of the Base:

"In these days of rationing, I congratulate you and your ships on the number of eggs found during the last two days. You are entitled to crow."

"Many thanks," he replies, "fortunately we were not broody."

MARKING THE SWEPT CHANNEL. Behind the last of the sweepers comes a special vessel, the "danner." She lays dan-buoys, seen here on deck, along the limits of the safe area.



A LTHOUGH THE CHIEF DUTY of the fleet sweepers is to clear dangerous areas, there have been times when they have responded to a call which was beyond their normal experience and made the utmost demand upon their endurance.

Such was Operation Dynamo: the evacuation of Dunkirk. Among all the ships which brought the British and French troops to safety the minesweepers have a proud record.

The "Smoky Joes" were there, among them H.M.S. Pangbourne (Commander Douglas Watson, R.N.), a veteran of the last war. When she reached Dunkirk on the afternoon of her first day she went alongside the mole and embarked 200 unwounded British troops. Later, under shell-fire all the time, she moved to the jetty on the south side of the harbour where a long line of ambulances was waiting. The cot cases were stowed side by side on the quarterdeck; the walking cases found room where they could. There were fifteen men in each officer's cabin, others in the baths, round the funnel and round the "bandstand" of the gun.

It was still dark when the Pangbourne steamed out of harbour, expecting to take her direction from a green light outside. Unknown to Commander Watson, the buoy had been bombed. He followed what turned out to be the starboard light of a steamer, and the ship ran aground on a sandbank. Fortunately the tide was flowing and she backed off two hours later. The exhausted soldiers did not realize that they had been aground.

The Pangbourne reached Ramsgate, disembarked the troops, and returned for more. One sergeant, who had tucked himself away in a corner, slept so well that he found himself back at Dunkirk.

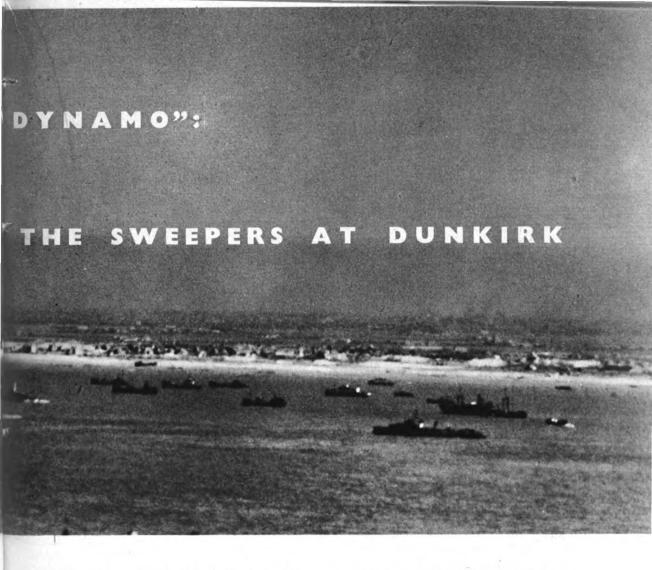
S.S. Clan MacAlister, which had been bombed at anchor outside the mole, was on fire aft and the German gunners were ranging on her. The Pangbourne took off the Master and twelve men. This time Commander Watson sent his whaler and motor boat to the beach. A score of dive-



bombers circled overhead, peeling off one by one to attack their targets. One dropped five bombs close to the Pangbourne. The explosions lifted her out of the water, and the men in the boats thought she had gone. Four of the gun's crew were killed, and the gun would not train. The First Lieutenant and the Sub-Lieutenant were wounded. A second aircraft bombed the ship beam on, but the only damage was from the splinters, which tore up the degaussing gear and holed the hull in over a hundred places above and below the water-line.

Commander Watson then gave the order to weigh, while the engineers plugged the holes





with chips of wood. The boats brought off a number of soldiers. Many French and Belgians, most of them wounded, climbed aboard from small boats. There was no surgeon on board, but they were made as comfortable as possible.

By that time it was 7 p.m. Commander Watson decided to return to Dover. On the passage he fell in with the Gracie Fields, a new paddle-sweeper which had been hit in her engine-room. The Pangbourne took off most of her people, leading a skeleton crew aboard, and began to tow her with the sweep-wire. Her rudder was jammed, so that she towed out on the starboard quarter, sinking slowly.

After an hour she had to be abandoned. The Pangbourne took off the skeleton crew, and since her compass had been knocked off the board by the bombing she steered by "lamp-post navigation"—from buoy to buoy—for darkness had fallen.

She approached Dover in the misty dawn, to be told that magnetic mines had been laid during the night in the harbour approaches. Her degaussing gear being wrecked, she had to steam in a circle until trawlers had swept the channel, but was able to disembark her troops later in the morning.

Meanwhile the paddle-sweepers were playing their parts beside the "Smoky Joes."

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The first on the scene came from Dover. They arrived each day at dusk, spent the night filling up with troops and tried to sail before daylight. There was no time for organized meals, but although they had only enough food on board for their crews, somehow every soldier was given at least a bowl of soup and a hunk of bread.

The senior ship of the flotilla, the Sandown (Commander K. M. Greig, R.N.) had a dachshund who became known as "Bombproof Bella." The ship was bombed repeatedly on every passage, but was never hit, and the ratings ascribed her preserva-Two other ships tion to their mascot. of the flotilla were not so fortunate. The Gracie Fields, which the Pangbourne tried to save, sank on her second trip. The Brighton Belle struck a wreck on her first return passage. As she was sinking, the fourth ship of the flotilla, the Medway Queen (Lt. A. T. Cook, R.N.R.), went alongside and took off all the survivors. The Medway Queen herself made seven trips to and from Dunkirk, which was the sweepers' record.

Another flotilla of paddle-sweepers, consisting of the Waverley, Marmion, Duchess of Fife and Oriole, reached Dunkirk from Harwich. On the first day the Waverley (Lieutenant S. F. Harmer-Elliott, R.N.V.R., Senior Officer) had embarked 600 troops when twelve Heinkels made a concentrated attack on her from a height of 8,000 feet. For half an hour she evaded the salvoes showered upon her crowded deck, but finally a bomb struck her on the port quarter and after wrecking the Ward Room flat passed through the bottom of the ship, leaving a hole six feet in diameter.

Four soldiers were killed and several wounded. The attack continued for another fifteen minutes, the bombers machine-gunning the upper deck, but the Waverley kept up a rapid fire with her 12-pounder and Lewis guns, supplemented by rifle-fire from the troops. No further bombs hit the ship,

and Lieutenant Harmer-Elliott had hopes of keeping her afloat until he fell in with another vessel to which he could transfer the troops. Soon, however, she became unmanageable and would not answer the wheel; then began to sink rapidly by the stern. Within one minute of the order "Abandon Ship" she had disappeared.

Lieutenant Harmer-Elliott went down with her, holding on to the bridge rails, and kicked himself free of obstructions as she heeled over to port. When he came to the surface he saw many of the troops trying to keep afloat, but the numbers thinned out within twenty minutes. The first ship to arrive was a French destroyer. guided by aircraft, several drifters and a tug picked up more survivors. Lieutenant Harmer-Elliott was rescued after being in the water for 45 minutes, but many of his ship's company perished and with them between 300 and 400 of the troops. He paid a high tribute to the soldiers, who behaved "with the highest courage and calmness and obeved all orders implicitly," and of his own men he wrote, asking that the survivors might be allowed to serve together again, "It has been my privilege to command one of the finest ship's companies."

The Marmion (Lieutenant H. C. Gaffney, R.N.V.R.) and the Duchess of Fife (Lieutenant I. Anderson, R.N.R.) fared better, each making three trips and bringing back over 2,000 British and French troops between them. Lieutenant Gaffney mentioned the fine spirit shown by his officers and men, many of whom were under shell-fire for the first time, in what he called "the somewhat arduous conditions," and Lieutenant Anderson reported that when he had sent his seaboats off to the beach to embark troops his junior engineer, Mr. V. N. Wood, volunteered to take the 19-foot skiff ashore. In this way Mr. Wood and the Second Engineer, Mr. A. R. Japp, with the Coxswain, Petty Officer A. Brassington, brought off 30 men in parties of six at a time.

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THE SWEEPERS WERE THERE. With all the other "little ships," vessels of the Minesweeping Service helped to bring home the British Army from Dunkirk. These men are safe on the deck of the drifter Fidget.

Lieutenant E. L. Davies, R.N.V.R., who was commanding the Oriole, finding on his arrival that there was a scarcity of power boats, and having none himself, took the responsibility of deliberately running his ship ashore, so that she could be used as a pontoon to evacuate the men on the beach. In this way he distributed 3,000 troops among the vessels in the offing, although the Oriole was being continually straddled by bombs. He refloated his ship in the evening during another severe bombing attack, returned to England with 700 soldiers and nurses on board, and then went back.

The Captain M.S., Harwich, wrote of the Oriole's company:

"There was no question of their requiring rest, but only a burning desire to get their ship coaled and turned round in order that they might get back to Dunkirk in the shortest time."

During these operations the men in the three surviving paddlers of the flotilla worked for four days and nights without sleep, almost without food, and between them brought 4,755 troops safely home.

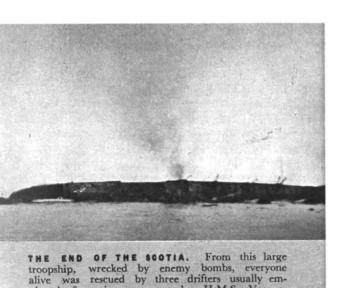
Some of the minesweeping drifters also took part in the evacuation. Towards the end of

1939 H.M.S. Vernon had specially equipped a flotilla of five East Coast herring drifters with the object of recovering ground mines by trawling. The flotilla consisted of the Lord Cavan, Silver Dawn, Fisher Boy, Jacketa, and Formidable, whose name was subsequently changed to Fidget, a blow from which her Skipper never fully recovered. In May, 1940, this flotilla, which had come to be called "Vernon's Private Navy," was operating from Ramsgate under Lieutenant-Commander A. J. Cubison, D.S.C., R.N., with Lieutenant R. S. Armitage, R.N.V.R., as Second-in-Command. The individual ships were commanded by Skippers, R.N.R., from the Grimsby and Hull deep-sea fishing fleets, and carried a crew of ten: mate, chief engineer, signalman, cook, four deckhands and two stokers.

When the evacuation began, the Mine Recovery Flotilla was sent over to Dunkirk with orders to act as ferry vessels between the harbour and the larger ships lying outside. On the evening they arrived they warped up to the East Mole, where the troops were lined up ready for embarkation. The drifters took 150 men each and then

set out to unload them into such larger ships as they could find. This proved difficult in the darkness. For a while they made determined efforts to discharge their troops into a merchant ship and were aggrieved at her apparent lack of interest, until they discovered that she was aground on a sandbank and had been abandoned. Eventually they succeeded in finding suitable ships, and returned to the harbour for a second load.

It was then decided that the Lord Cavan should remain at Dunkirk with Lieutenant-Commander Cubison, and that Lieutenant Armitage, in the Fidget, should sail the remainder of the flotilla back to Ramsgate with the troops. On the two following days the four drifters continued their work, sailing from Ramsgate in tompany, splitting up onthe other side, collecting men as and how they could, and returning independently as soon as each ship was loaded. Although their instructions were to limit their loads to 100 men, they usually took over 200, the record being made by the Silver Dawn, who on one passage carried 312. Such loads would have been unsafe in anything but calm weather, but even so a number of soldiers who had swum out to the ships had to be refused passage. Lieutenant Armitage described



ployed for mine recovery by H.M.S. Vernon. These three drifters and two others (one was the these men as being "amazingly philosophical," and they swam back to the beach with cheerful comments on the wetness of the water.

Although subjected to incessant bombing attacks the only one of Lieutenant Armitage's drifters to suffer damage was the Silver Dawn, who lost a propeller blade on some wreckage in Dunkirk harbour on the third day, but succeeded in reaching Ramsgate with her troops on board.

On their outward passage on the last day the remaining three drifters came up with a large troopship, the Scotia, which had sustained five direct hits from bombs, and was lying on her side burning fiercely. The sea was full of French troops, whom German aircraft were machine-gunning as they struggled in the water. Having rescued everyone left alive, the three drifters turned back with the survivors, most of whom were severely wounded.

In all, the four drifters brought back 4,085 soldiers. The Lord Cavan was sunk by shell-fire, but the entire ship's company returned safely.

The trawlers also did valiant work, although many of the skippers were over fifty years of age and most of the junior officers and ratings had previously seen nothing of war. Eight trawlers alone brought back 1,606 British, French and Belgian troops. Losses were severe. One Skipper, as he was picking up soldiers from the water, saw a bomb strike a sister ship. There was no sign of her when the smoke of the explosion had cleared away. Another sank near the East Pier alongside the wreck of a British destroyer, her White Ensign still flying just above the water throughout the evacuation.

Perhaps H.M.T. St. Melanté had the most varied experience of all. She had been sweeping off the Hook when the Germans invaded Holland. A near miss from a bomb wounded both the Skipper, the Second Skipper and three seamen, and flung Second Hand (now Skipper) F. Hayward violently

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on his back. Hayward gave the men first aid and took them to hospital. He refused to remain himself, although in great pain, since there was no one else to take charge of the ship. Next day the Germans captured the hospital and his shipmates became prisoners of war.

The St. Melanté, with her consort the Arctic Hunter, then went to Flushing, where she was bombed and raked by machine-gun fire, and later reached Zeebrugge. The water was thick with mines, and ships were going up every hour. The trawlers swept the harbour approaches and took on board the crew of a bombed Greek ship, then were ordered to return to their Base. On arrival both ships' companies were given five days' leave. An hour later leave was cancelled and the St. Melanté was told to proceed to Dunkirk.

There was no need to look at the chart, for over Dunkirk hung a pall of smoke which could be seen for miles. Bombs were dropping as the trawler reached the quay, where she embarked 600 troops. The men were worn out but revived once they were on board, under the impression that they were "safe with the Navy." They were distributed along the deck, in the cabin, in the stokehold, and on the gun-platform. The ship was bombed the whole way back to Dover, but there were no casualties.

The St. Melanté's next duty was to sweep at Le Havre. As she approached the harbour the oil tanks were blazing, and on arrival she was ordered to St. Valery, where 6,000 troops were believed to be surrounded on a strip of beach. The relief force consisted of a score of small vessels: trawlers, sloops and a destroyer. They reached the rendezvous at midnight and sent the boats in. But the beach was empty. When dawn broke there was no sign of troops. All had been taken prisoner. During the night the St. Melanté found a French yacht adrift. She was intact, but everyone aboard was dead. They looked as if they had been murdered.

The St. Melanté then returned to Portsmouth and was ordered to St. Nazaire in company with the trawler Asama. They reached the harbour to find the quay lined six deep with troops, who extended as far as the eye could see. The St. Melanté took 670 on board. The Asama, a destroyer and a French tug took others, and ferried them to the transports waiting in the harbour. The ships were bombed all the way out, but the soldiers stood the ordeal unflinchingly.

This work went on for three days and nights. There seemed no end to the troops. The St. Melanté's men found themselves "napping on their feet," as Skipper Hayward put it. They saw the Lancastria go thown.

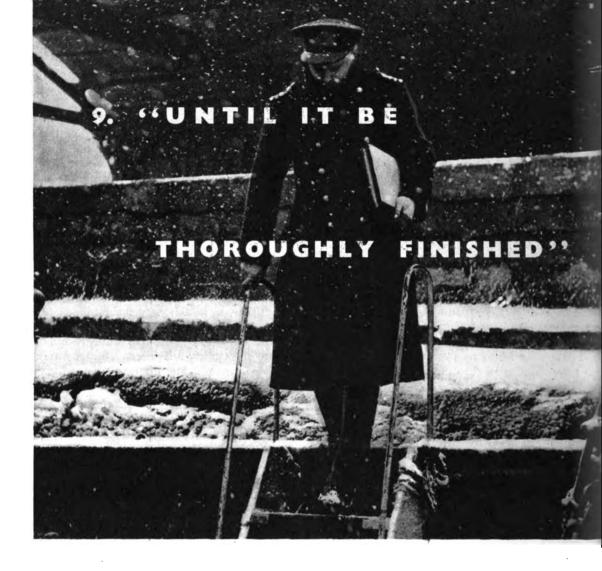
Skipper Hayward was beginning to lose the use of his legs from the effect of his fall, but he refused to go to hospital. Then a fleet of trawlers arrived, with civilian crews and their fishing gear still on board, and the evacuation was at last completed. But the troopships still had to be taken safely out of harbour, the approaches to which were suspected of being mined. Skipper Hayward was told, "Although your crew are off their feet, you must sweep us out."

At dawn the St. Melanté and the Asama went ahead of the great convoy—twenty merchant ships packed with troops, with ten fishing trawlers and the destroyer escorts. They swept from the lock gates into the open sea; then took up their position on either side of the convoy and steamed with it to Plymouth.

That, so far as Skipper Hayward was concerned, was the end of what he called "all that bother across you side."

He was loud in his praise of his men. They were all landsmen except the Leading Seaman, a giant with ginger hair, who, when he sighted enemy aircraft, would man the gun and bawl out imploringly, "Come over 'ere! Just come over a little closer!"

"Yes, the men behaved as though they had a job," said Skipper Hayward.



THE BRITISH AND FRENCH armies had cause to be grateful to the mine-sweepers at Dunkirk and St. Nazaire; and there have been times when the trawlers have been able to pay the Royal Air Force a trifle on account of their debt for fighter protection, since their prompt action has saved the lives of many friendly pilots—or "Kates" as the Navy calls them—in the Channel or the North Sea.

One trawler picked up a pilot off the East Coast without interfering with her sweep, and when a Spitfire was forced down near H.M.T. Staunch, Leading Wireman A. L. Elliott, with two other ratings, dived into the sea, swam to a Carley float which had been slipped, and rescued the pilot, who had been badly shaken in the crash.

There are also naval ratings who owe their lives to the sweepers. After the destroyer Wren had been sunk by enemy aircraft, a trawler sent her boat away to pick up survivors. The boat's crew saw an exhausted man struggling in the oil fuel which lay thickly on the sea where the destroyer had gone down. Second Engineman B. E.

Bemment, R.N.R., who had rushed up from below and jumped into the boat as it was putting off, saw that they could not reach the spot in time. Without a lifebelt he dived overboard, swam to the drowning man, and at the risk of being blinded and choked by the oil-covered sea kept him afloat until the boat reached them.

When a hospital ship had been crippled off Tobruk by 18 dive-bombers, a minesweeper saved the entire ship's company, including her cat, and then escorted her while she was being towed to Alexandria.

Another sweeper, a South African whaler, went to the rescue of a petrol-carrying steamer which had been torpedoed off Tobruk. The blazing petrol tins which floated out from an enormous hole in the ship's hull had set the sea on fire all round her, the flames shooting 300 feet into the air. The whaler approached to within 300 yards, picked up 31 men from a boat and two rafts, and then cruised for an hour in search of seven missing members of the crew.

The sweepers are as ready to save ships as men. H.M.T. River Clyde (Lieutenant-Commander J. A. McArthur, R.N.) saw a merchant vessel hit three times by enemy aircraft. The after hold was flooded and she was down by the stern, but Lieutenant-Commander McArthur believed that if the after hulkhead held she might at least be beached. He towed her for seven and a half hours through the night until he was able to hand her over to a tug in coastal waters.

Many deeds of gallantry have been performed in saving the sweepers themselves. While carrying out a clearance off the East Coast, H.M.S. Selkirk, one of the Albury class, found a mine in her sweep. She was steaming at speed in an attempt to cut the mooring when the sinker of the mine broke surface. In the hope of recovering it, a signal was sent to the Base.

Within twenty minutes of receiving the signal, Commander W. R. Bull, D.S.M., R.N., the Port Minesweeping Officer, had

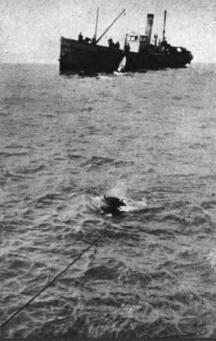
collected a tug (the Sunbeam II) and was under way. On reaching the Selkirk he found that a shackle on the mine had caught in one of the cutters. He had the sweep hove in so as to place the mine about five fathoms astern of the ship. A boat was lowered and, assisted by Able Seamen E. J. Quick and J. W. Clark, Commander Bull proceeded to salvage the sinker, mine and mooring. Although the sea was calm, there was a strong tide running and enough lop to make the operation extremely hazardous. One of the seamen had to hold the horns of the mine away from the boat, while the other dealt with the recovery wire. Both sinker and mooring wire were secured without mishap, and the tug towed the mine back to harbour for disposal. This was the first German live moored mine to be recovered complete with its sinker. For his courage and resource Commander Bull was awarded the D.S.C., and his two assistants received the D.S.M.

The work of the sweepers is not comfined to British waters. They have had to clear minefields laid by the Italians in many parts



A QUIET 408. At first it looks a casual scene. But note that the men in the dinghy wear steel helmets and life-belts, that their eyes are glued on the white object in the water. It is a tell-tale parachute. Below it is a live mine.







1. The men of the tug Sunbeam II methodically prepare to recover (in August, 1940) the first live German mine to be captured complete with mooring and sinker of this type. It is going to be a difficult operation.

2. Mine and sinker are both entangled in the sweep of the minesweeper Selkirk, from which these pictures were taken. The tug is securing the far end of the Selkirk's sweepwire by hoisting the float inboard.

3. Next, the otter is hauled aboard. Note the strong tide breaking past the mine, now suspended with its sinker on the wire running between the two ships. The headplate of the mine can be seen.

of the Mediterranean; the approaches to Valetta Harbour have been swept regularly in spite of the constant raids on Malta. As in the last war, surface minelayers have at times been active in distant waters, and mines have been swept off the coasts of Africa, Australia and New Zealand. The Indian Ocean has not remained uncontaminated, and there the sweepers of the Royal Indian Navy have been at work. During the Japanese attack on Malaya, mines were laid in the South China Sea, and sweepers, many of them manned by men

of the Malayan R.N.V.R., worked gallantly until the end.

Minesweeping in Arctic waters became increasingly important with the sending of convoys to Russian ports. This work was allotted to fleet sweepers of the Halcyon class. The first sheet ice they encountered was in October, 1941, and was three inches thick. At first they nosed their way through it with infinite care, until a Norwegian officer serving in one of the ships said that these conditions were nothing compared with what they might expect later. Then they







A wire is passed from the Sunbeam round the mine mooring and back the tug. The crew try to pull oth mine and sinker clear, but the liker is too heavy. Pulling only brings to tug dangerously close to the mine.

5. A new method is tried. A boat is launched, and while one man holds the horns of the live mine away from the bows, another unfastens the sinker chain from the mine and fastens it to a direct wire from the tug.

6. This is successful. The sinker is being hauled up the tug's starboard bow. Next the recovery wire was attached to the mine itself. It was towed safely back to Harwich, and the sinker taken ashore to be examined.

took to driving through the ice contemptuously at full speed. Soon it became thicker and more widespread until, as the Senior Officer put it, "bogey" for the 24-mile course along the tortuous approaches to Archangel rose to 48 hours. There were times when the ratings had to dig holes in the ice before they could weigh the anchors. It was disconcerting to have to sound the sirens to remove people, and even horses, from the ship's course, and strange to pass a market in full swing on the ice a few yards away.

Thus the sweepers are doing their full

share in the struggle to deny the Axis Powers command of the sea and to foil the onslaught on sea-borne trade, and neither the Fleet nor the Merchant Navy could do without them.

Minesweeping demands not only courage of a high order, but also integrity and precise navigation to ensure the safety of the ships which follow. The work must often be done in the face of air attack, and the slightest error of judgment may expose a ship and sink all aboard her. The sweepers fight an enemy who, although unseen—except in the air—is always potentially present beneath the surface of the sea. For them there is none of the excitement of battle, yet, unless they are constantly alert, at any moment the foe may take them unawares. Their unspectacular task is no measure of the peculiar strain to which they are subjected. Since the war began more than one hundred of them have been lost, but others have filled the gaps, and month by month the Service is expanding in ships and men.

Of those men, none deserve the nation's thoughts more than the engineers and the stokers who work below. Theirs is the most perilous work of all, for if a sweeper is mined or hit by bombs they have the least chance of survival. Bursting pipes, scalding steam from damaged boilers, closed hatches, ladders wrenched from fastenings: these are risks they accept every time they put to sea, yet they never fail.

"He kept the machinery running while working up to his waist in water after his ship had been hit during a bombing attack." Thus runs one official recommendation for an award to a trawler's engineman. There have been many such.

When the engine-room of H.M.T. Edwardian began to make water fast after a near miss from a heavy bomb, First Engineman William Gray, alone and in complete darkness, stopped his main engine, although well aware that the aircraft might return, and then filled the hole with canvas, feeling his way over the flooring supports, since there were no engine-room plates left in position. After stopping the main flow of water he completed his work with a saw and a danstaff, and so saved the ship.

Those on deck, confident of the steadfastness of their comrades below, can thus do their duty with cheerful hearts, and so earn words like these: "He was ready at all times, at whatever hour of the day or night, to engage the enemy."

Over 25,000 men are now engaged in the Minesweeping Service. Every month new ships go from the yards to join those which have been sweeping since the war began. The fleet sweepers and the trawlers, paddlers, motor minesweepers, whalers and drifters have been engaged on continuous sweeps, almost entirely in the channels used by shipping. The value of that service has been incalculable, for every mine found and detonated may mean a ship saved, and every minefield cleared is a battle won.

Truly, as Fluellen said in King Henry V, "it is not so good to come to the mines," and to-day they are even less according to "the disciplines of war" than he envisaged. This does not deter the sweepers from tackling them wherever they may find them, in order that the Psalmist's comfortable promise against workers of iniquity may be fulfilled and that they may "soon be cut down like grass."

Unremitting vigilance in tempest and fair weather, tribulation and unceasing danger, are the sweepers' portion, and their work must go on, day after day, week after week, so long as the sea holds mines. For them there can be no respite. Until peace comes, their task cannot know the culmination of success; and although they will have their part—a great one—in the final victory, even so their work will not be over, for then they must glean from the seas those mines which, still unswept, would remain a menace to peaceful merchantmen.

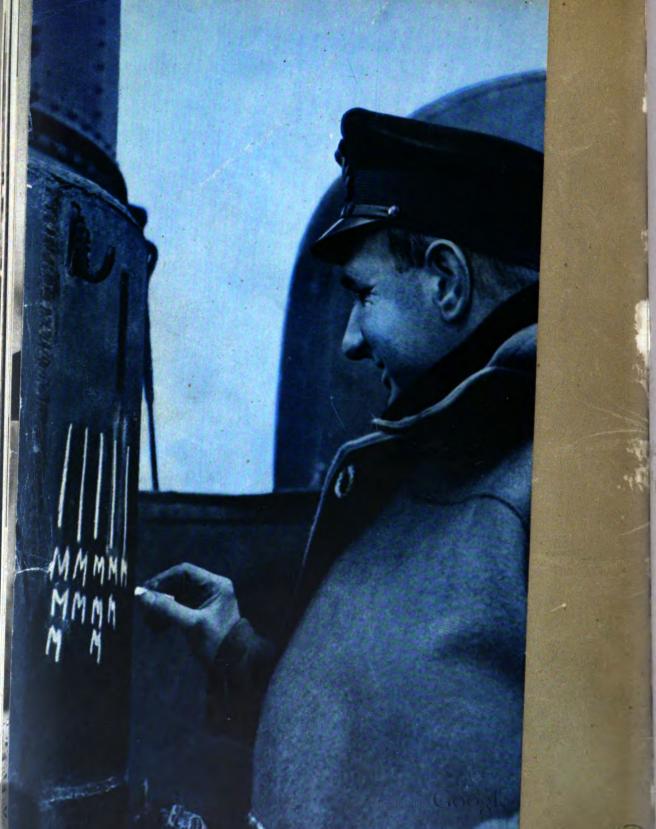
Drake before Cadiz is said to have prayed that his men should understand that it is not the beginning but the continuing of any great matter "until it be thoroughly finished" which yields the true glory. His Majesty's Minesweepers have learnt that lesson, and it is one which they are not likely to forget.







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